

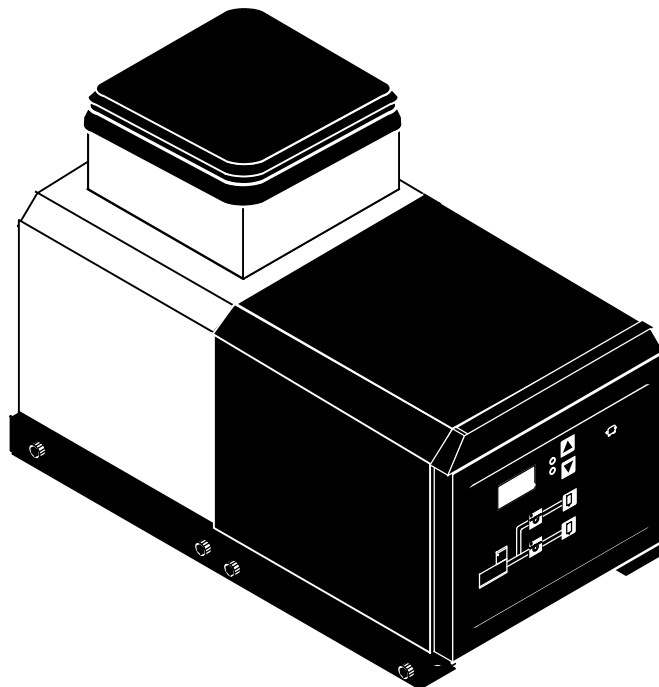


The Next Level of Technology

■ innovation ■ service ■ reliability

DYNAMINI[™] ADHESIVE SUPPLY UNIT OPERATIONS AND SERVICE MANUAL

with Software Version 2.00 and up



IMPORTANT ! - READ ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

It is the customer's responsibility to have all operators and service personnel read and understand this information. Contact your ITW Dynatec customer service representative for additional copies.

NOTICE! Please be sure to include the serial number of your application system each time you order replacement parts and/or supplies. This will enable us to send you the correct items that you need.

**ITW Dynatec Service Parts Direct Dial: 1-800-538-9540
ITW Dynatec Technical Service Direct Dial: 1-800-654-6711**

EC declaration of conformity

according to the EU Machinery Directive 2006/42/EG, Annex II, 1.A

Manufacturer:

ITW Dynatec,
31 Volunteer Drive
TN 37075 Hendersonville

Person residing within the Community authorised to compile the relevant technical documentation:

Dynatec Engineering
ITW Dynatec,
31 Volunteer Dr
Tennessee Hendersonville

Description and identification of the machinery:

Make:	Adhesive supply unit
Serial no:	_____
Machine number:	_____
Project number:	Dynamini
Project name:	Dynamini 05/10
Commercial name:	Dynamini

It is expressly declared that the machinery the machinery fulfils all relevant provisions of the following EU Directives:

2006/42/EG:2006-05-17	EU Machinery Directive 2006/42/EG
2006/95/EC:2006-12-12	(Voltage limits) Directive of the european Parliament and of the council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (codified version)
2004/108/EC:2004-12-15	(Electromagnetic compatibility) Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

Hendersonville, 2010.06.15

Place, date

Signature
Judson Broome
General Manager

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Chapter 1 SAFETY PRECAUTIONS

All operators and service personnel must read and understand this manual before operating or servicing equipment.

All maintenance and service on this equipment must be performed by trained technicians.

Electrical



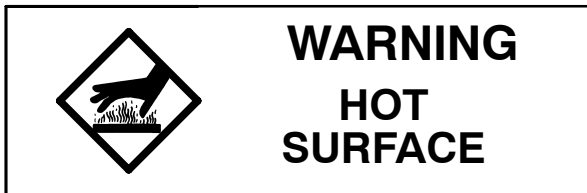
Dangerous voltages exist at several points in this equipment. To avoid personal injury, do not touch exposed connections and components while input

power is on. Disconnect, lockout and tag external electrical power before removing protective panels.

A secure connection to a reliable earth ground is essential for safe operation.

A disconnect switch with lockout capability must be provided in the line ahead of the unit. Wiring used to supply electrical power should be installed by a qualified electrician.

High Temperatures



Severe burns can occur if unprotected skin comes in contact with molten adhesive or hot application system parts.

Safety glasses, gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

High Pressure



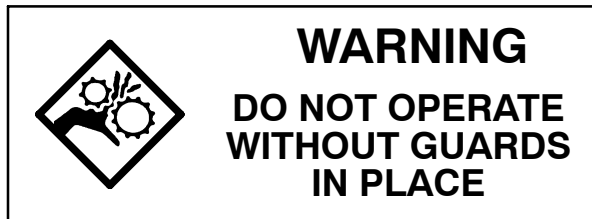
To avoid personal injury, do not operate the equipment without all covers, panels and safety guards properly installed.

To prevent serious injury from molten adhesive under pressure when servicing the equipment, disengage the pumps and relieve the adhesive system's hydraulic pressure (e.g., trigger the heads, hand-held applicators, and/or other application devices into a waste container) before opening any hydraulic fittings or connections.

IMPORTANT NOTE: Even when a system's pressure gauge reads "0" psig, residual pressure and trapped air can remain within it causing hot adhesive and pressure to escape without warning when a filter cap or a hose or hydraulic connection is loosened or removed. For this reason, always wear eye protection and protective clothing.

Either of the two High Pressure symbols shown may be used on equipment.

Protective Covers



Keep all guards in place!

To avoid personal injury, do not operate the application system without all covers, panels and safety guards properly installed.

Eye Protection & Protective Clothing



Wear safety glasses with side shields which conform to ANSI Z87.1 or EN166.

Failure to wear safety glasses could result in severe eye injury.

It is important to protect yourself from potential burns when working around hot melt adhesive equipment.

Wear protective gloves and long-sleeved, protective clothing to prevent burns that could result from contact with hot material or hot components.

Always wear steel-reinforced safety shoes.

It is very important that you PROTECT YOUR EYES when working around hot melt adhesive equipment!

Safe Installation and Operation

To avoid possible failure of hoses, make sure all hoses are routed to avoid kinking, tight radius turns (8" or less) and abrasive contact. Hot-melt hoses should not have prolonged contact with heat-absorbing surfaces such as cold floors or metal troughs. These heat-absorbing surfaces can alter adhesive flow and cause incorrect calibration. Hoses should never be covered with materials that prevent heat dissipation, such as insulation or sheathing.

Read this manual before applying electrical power to the equipment. Equipment may be damaged by incorrect electrical connections.

Do not use adhesive that is dirty or that may be chemically contaminated. Doing so can cause system

clogging and pump damage.

When adhesive hand-held applicators or other movable applicators are used, never point them at yourself or at any other person. Never leave a hand-held applicator's trigger unlocked when not actually in use.

Do not operate the hopper or other system components without adhesive for more than 15 minutes if the temperature is 150 degrees C (300 degrees F) or more. To do so will cause charring of the residual adhesive.

Never activate the heads, hand-held applicators and/ or other application devices until the adhesive's temperature is within the operating range. Severe damage could result to internal parts and seals.

Treatment for Burns From Hot Melt Adhesives

Burns caused by hot melt adhesive must be treated at a burn center.

Care should be used when working with hot melt adhesives in the molten state. Because they rapidly

solidify, they present a unique hazard.

Even when first solidified, they are still hot and can cause severe burns. When working near a hot melt application system, always wear safety gloves, safety glasses and long-sleeved, protective clothing.

Always have first-aid information and supplies available.

Call a physician and/or an emergency medical technician immediately.

Service

Refer all servicing to qualified personnel only.

Explosion/ Fire Hazard

Never operate this unit in an explosive environment.

Use cleaning compounds recommended by ITW Dynatec or your adhesive supplier only. Flash points

of cleaning compounds vary according to their composition, so consult with your supplier to determine the maximum heating temperatures and safety precautions.

Lockout/ Tagout

Follow OSHA 1910.147 (Lockout/ Tagout Regulation) for equipment's lockout procedures and other important lockout/ tagout guidelines.

Be familiar with all lockout sources on the equipment.

Even after the equipment has been locked out, there may be stored energy in the application system, particularly in the capacitors within the panel box. To ensure that all stored energy is relieved, wait at least one minute before servicing electrical capacitors.

Use of PUR (Polyurethane) Adhesives

PUR adhesives emit fumes (MDI and TDI) that can be dangerous to anyone exposed to them. These fumes cannot be detected by the sense of smell. ITW Dynatec strongly recommends that an exhaust hood or system be installed over any PUR system.

Consult with your adhesive manufacturer for specifics about required ventilation.



CAUTION: Because of the nature of PUR adhesives to strongly bond in the presence of moisture, care must be taken to prevent them from curing inside Dynatec equipment. If PUR adhesive solidifies in a unit, the unit must be replaced. Always purge old PUR adhesive from the system per your adhesive manufacturer's instructions and timetable. ALLOWING PUR ADHESIVE TO CURE IN A UNIT VOIDS ITW DYNATEC'S WARRANTY.

In This Manual

WARNINGS and CAUTIONS are found throughout this manual.

WARNINGS mean that failure to observe the specific

instructions may cause injury to personnel.

CAUTIONS mean that failure to observe the specific instructions may damage the equipment.

ITW Dynatec
An Illinois Tool Works Company



Adhesive Application Solutions

Chapter 2 SPECIFICATIONS AND DIMENSIONS

	N	X	2	X	X	X	X	-	X	X	X	X
DYNAMINI												
5 = 5 kg/ 10 lb.												
1 = 10 kg/ 20 lb.												
HOSE: 2-hose capable												
PUMP TYPE:												
P12 = Piston Pump 12:1												
GAS = Gear Pump 1.5cc												
GBS = Gear Pump 3.2cc												
GCS = Gear Pump 4.5cc												
GDS = Gear Pump 0.55cc												
GES = Gear Pump 10cc												
VOLTAGE:												
1 = 100 - 120VAC, 1 phase												
2 = 200 - 240VAC, 1 phase												
OPTIONS:												
ACCESSORIES:												
F = 100 mesh/ 149 micron outlet filter (40 mesh/ 420 micron is standard)												
G = Analog pressure gauge												
V = Swirl kit, 1 hose												
W = Swirl kit, 2 hose												
CONFIGURED SYSTEM OPTIONS:												
C24 = 2.4m/ 8 ft. Abrasion resistant hose												
C36 = 3.6m/ 12 ft. Abrasion resistant hose												
CHB = Hand Bead Applicator												
CHS = Hand Swirl Applicator												
STACKTITE SYSTEM OPTIONS:												
SB = Bead applicator												
SS = Swirl applicator												

EXAMPLE:

N52GAS2-F = Dynamini 10 lb. hopper w/ 1.5cc gear pump, 240 VAC/ 1 phase and 100 mesh outlet filter.

Specifications

Environmental:

Storage/ shipping temperature	-40° C to 70°C (-40° F to 158°F)
Ambient service temperature	-7° C to 50°C (20° F to 122°F)
Noise emission	TBD < db(A)

Physical:

Dimensions	see dimensional layouts on following pages
Number of heads/ hoses	2
Number of hopper temperature zones	1
Number of pumps	1
Piston pump ratio	12:1
Gear pump	see options on page 2-1
Enclosure	styled, durable metal and high temp plastic, dust and splatter resistant
Hose connections	Electrical: universal 15-pin Amphenol connectors at asu, Mechanical: wrench-secured fluid fittings (#6 JIC)
Hopper (tank) capacity	Model 05: 5 kg/ 11 lb Model 10: 10 kg/ 20 lb
Hopper construction	cast-in heaters, TFE Teflon impregnated
Filtration	hopper bottom screen, manifold basket filter
Weight, empty	tbd kg/ tbd lb
Adhesive form	standard grades (non-water based only)

Electrical:

Power Supply Required	100-120 VAC/ 1p/ 50-60 Hz/ 15 Ampere or 200-240 VAC/ 1p/ 50-60 Hz/ 30 Ampere
Hopper heater type	cast-in tubular
Power consumption, system maximum	100-120 VAC system: 1800 watts 200-240 VAC system: 6800 watts (w. piston pump) 200-240 VAC system: 7200 watts (w. gear pump)
Hopper Power	100-120 VAC system: 600 watts at 120 VAC 200-240 VAC system: 1200 watts at 240 VAC
Temperature control	microcontroller
Temperature sensors	100 Ohm Platinum RTD standard
Gear pump Motor	1/4 hp, constant speed, AC, direct drive, horizontal orientation

Pressurized Air:

Air pressure supply	1.4 to 6.8 bar (20 to 100 psig)
Air consumption at 60 pump cycles per minute	90 normal liters/ minute (3.2 SCFM at 100 psig)

Performance:

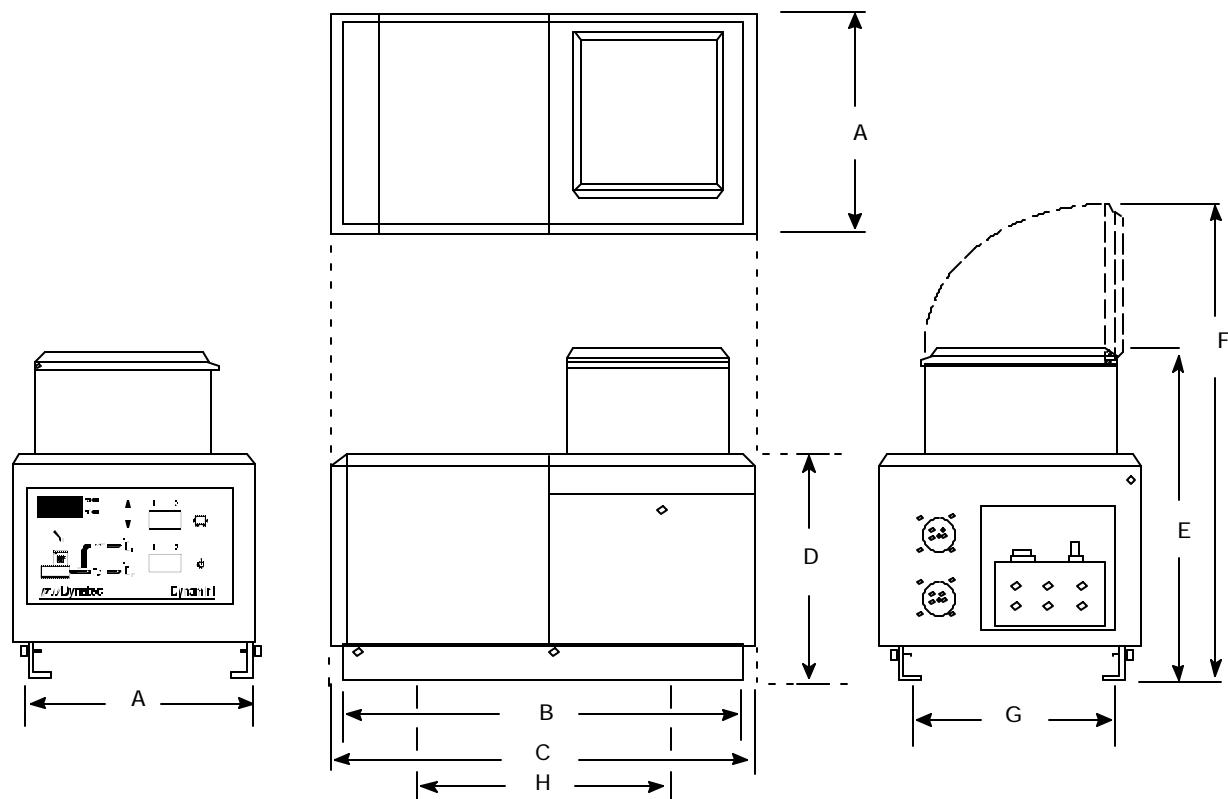
Adhesive temperature control range	40°C to 218°C (100°F to 425°F)
Adhesive temperature control accuracy	± 1°C (± 1°F)
Over-temperature cutoff for hopper	232°C (450°F)
Adhesive viscosity	500 to 50,000 centipoise
Warm-up time, full hopper	approximately .5 hour
Adhesive delivery rate, open line	.91 kg/min (2 lb/min)(12:1 piston pump)
Adhesive melt rate (depends on adhesive used)	8 kg/hr (17.3 lb/hr)
Adhesive pressure	up to 68 bar (1000 psi) maximum
Maximum pump speed, piston pump	60 pump cycles per minute
Maximum pump speed, gear pump	87 revolutions per minute, 60 Hz, constant speed 73 revolutions per minute, 50 Hz, constant speed

Dynamini Temperature Control:

Controller board	1 printed circuit board
Display type	long-life, light-emitting diode (LED)
Temperature control zones	5 triac-output

Other:

Operator interface	digital display with simplified, all-icon keypad
Temperature offset	no
Sensor open error message	yes
CE approval granted	yes



DIMENSION	A	B	C	D	E	F	G	H mounting holes*
MODEL 05 (mm)	289	527	540	238	451	635	249	381
MODEL 05 (inches)	11.38	20.75	21.25	9.37	17.75	25.0	9.8	15.0
MODEL 10 (mm)	289	527	540	238	654	838	249	381
MODEL 10 (inches)	11.38	20.75	21.25	9.37	25.75	33.0	9.8	15.0

* All Mounting holes are 10mm diameter.

Chapter 3 INSTALLATION & START-UP

Mounting the DYNAMINI ASU

The DYNAMINI ASU can be mounted on most flat surfaces, on either an open or a solid frame (as shown below). The main electrical power and the serial communication connections come in from below the unit and connect under the keypad. Access to the underside of the ASU is not a necessary consideration in mounting the unit.

The Dynamini's hinged hopper lid may be rotated 90 degrees in any direction.

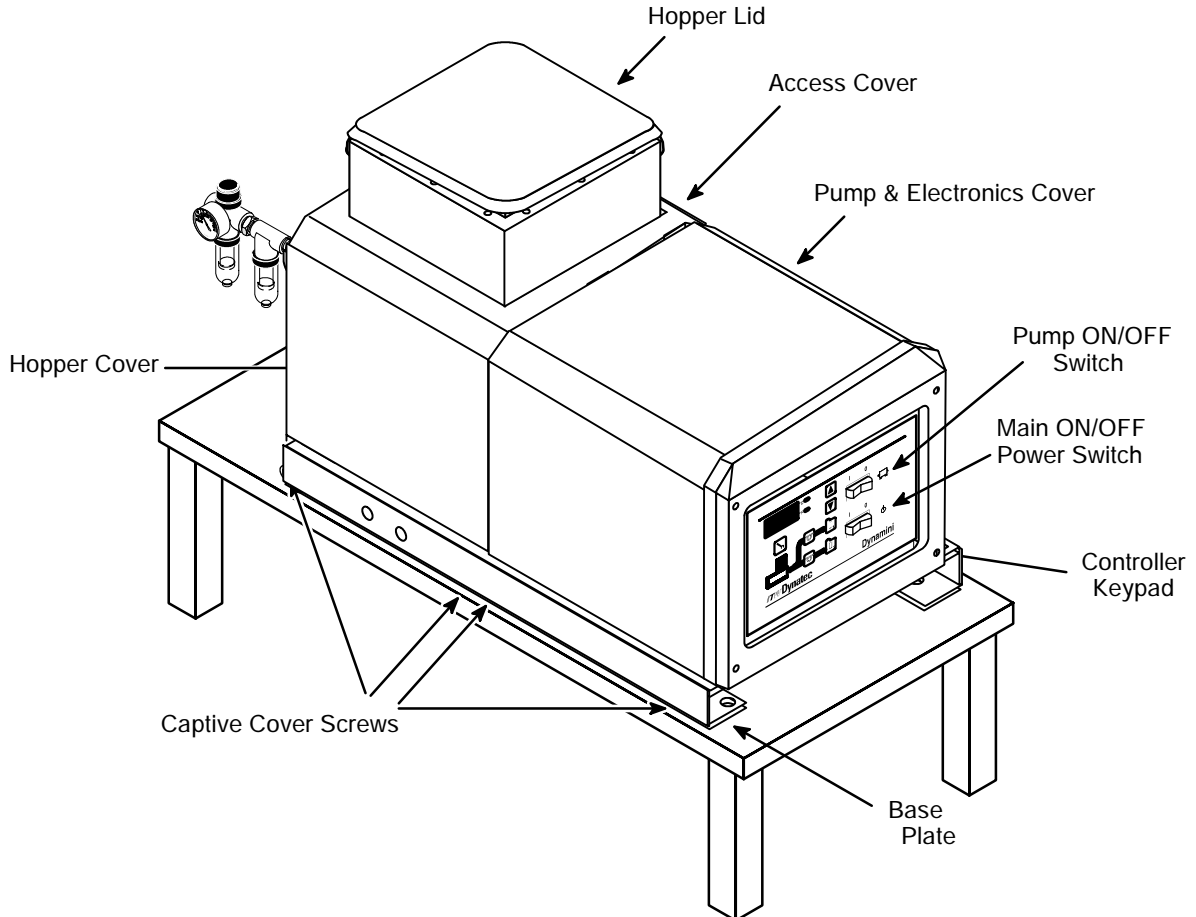
For installation dimensions, see illustration on page 2-4.

Lifting the ASU



WARNING

The unit must be lifted by two persons, using proper lifting technique, one person at either end. Securely hold it under its base plate. No belts or hooks should be used. Never allow anyone to stand on the ASU.



Installation

NOTE: Re-read Chapter 1 “Safety Precautions” before performing any installation procedures. All installation procedures must be performed by qualified, trained technicians.

After the DYNAMINI ASU has been properly mounted, the following general sequence should be followed for installation:

1. Make sure that incoming line power to the ASU is turned OFF at a customer-provided circuit breaker. Incoming line power must be overcurrent-protected.

DANGER HIGH VOLTAGE



Disconnect and lockout input power to the application system before starting any installation procedures. Make sure there is no electrical power on the leads you will be connecting. THE UNIT'S MAIN SWITCH DOES NOT SHUT OFF ALL POWER WITHIN UNIT!! Make sure incoming line power is turned off at the customer-provided circuit breaker before opening unit.

2. For 200-240 VAC units, power supply wires should be rated for 30 Amperes service and should include an earth ground conductor.

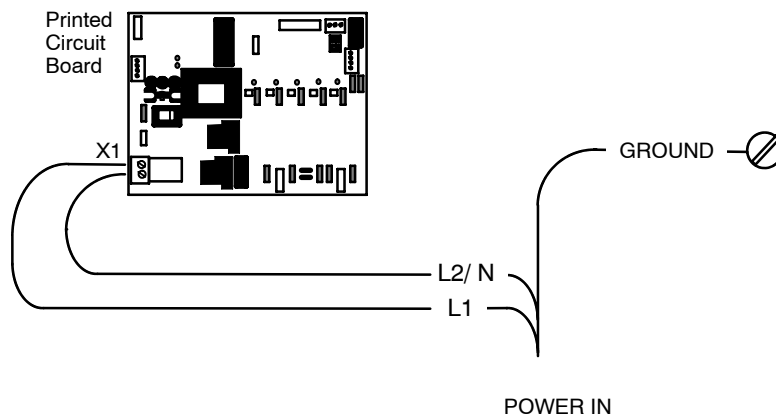


CAUTION: Grounding conductors never carry electrical current. The use of a neutral conducting wire as earth ground is incorrect and may cause damage to the equipment.

3. 100-120 VAC units are supplied with a line cord and a plug suitable for use in North America on 15 AMP power supplies. For other types of 100-120 VAC power wiring, supply wires should be rated for 15 Amp service and include an earth ground conductor.

4. Acceptable power supplies are either 100-120 VAC 1-Ph 50/60 Hz with a neutral wire, or 200-240 VAC 1-Ph 50/60 Hz. The information plate on the ASU (adhesive supply unit) will indicate the required power supply.

5. Power supply wires are to be connected to the removable plug at header X1 on the printed circuit board, as shown below.



Supply Power Installation Diagram

6. Reassemble the pump and electronics cover to the ASU.

7. *Gear Pump models*: omit this step.

Piston Pump models: Install the Air Control/ Filter Unit (containing the air regulator, the coalescing filter and pre-filter). See illustration on page 3-5. The air control/ filter unit is mounted directly to the ASU via a threaded hole on the rear cover. Wrap Teflon tape around the nipple fitting before installing in the ASU. The unit requires clean, dry air. NEVER use lubricated air.

For operator convenience, the air pressure gauge can be mounted to either side of the air control regulator.

With the air pressure regulator, a clockwise turn increases pressure. A counter-clockwise turn decreases pressure. The recommended pressure is 1.4 to 5.6 bar (20 to 82 psi).

8. Refer to the Wattage Availability Chart on the next page to determine the hose and head power available for the various configurations of the Dynamini ASU.

9. The adhesive hoses are connected at the rear cover (see illustration on page 3-5). Make your electrical hose connections at the two numbered connects on the left side of the cover. Route hoses so that there is at least an eight-inch radius at any bend. Do not hang hoses without proper support. Do not crimp, clamp, squeeze or tie hoses.

The hose adhesive ports are located at the bottom of the filter block, to the right of the electrical connections. There are three ports for the use of up to two hoses and for the (optional) adhesive pressure gauge. When making hose connections, use the numbered guides shown on the illustration to coordinate; ie. when using one hose make your hookup to electrical connection #1 and adhesive port #1. When using two heads/ hoses, hookup hose/ head #1 to electrical connection #1 and adhesive port #1, then hookup hose/ head #2 to electrical connection #2 and adhesive port #2.

Refer to the hose and applicator manuals for further details on these items.

10. Install the hose manifold outlet cover by sliding it into place and attaching with the two M4 screws provided.

Wattage Availability Chart

ASU Voltage	Max. System Wattage	Hopper Wattage	Gear Pump Motor Wattage	Wattage Available for All Hoses and Heads	
				Piston Pump	Gear Pump
100-120 VAC	1800 @ 120VAC	600 @ 120VAC	370 @120VAC	1200 @ 120VAC	830 @ 120VAC
200-240 VAC	7200 @ 240VAC	1200 @ 240VAC	370 @ 240VAC	6000 @ 240VAC	5630 @ 240VAC

Notes:

1. Assume 33 Watts per foot of hose, #6 hose at 120VAC or 240VAC.
2. Assume 100 Watts per inch of head width, at 120VAC or 240VAC.
3. The power available for any one hose or head is 720 Watts at 120VAC or 1440 Watts at 240VAC.
4. At reduced voltage, less wattage is available. For example: 120 volt equipment operated on 100 volts or 240 volt equipment on 200 volts, will develop wattage 31% lower than the wattage available at 120 or 240 volts.

Adding Adhesive



WARNING HOT ADHESIVE

Do not overfill the hopper (melt tank) since adhesive generally expands as it melts and a full hopper will overflow.

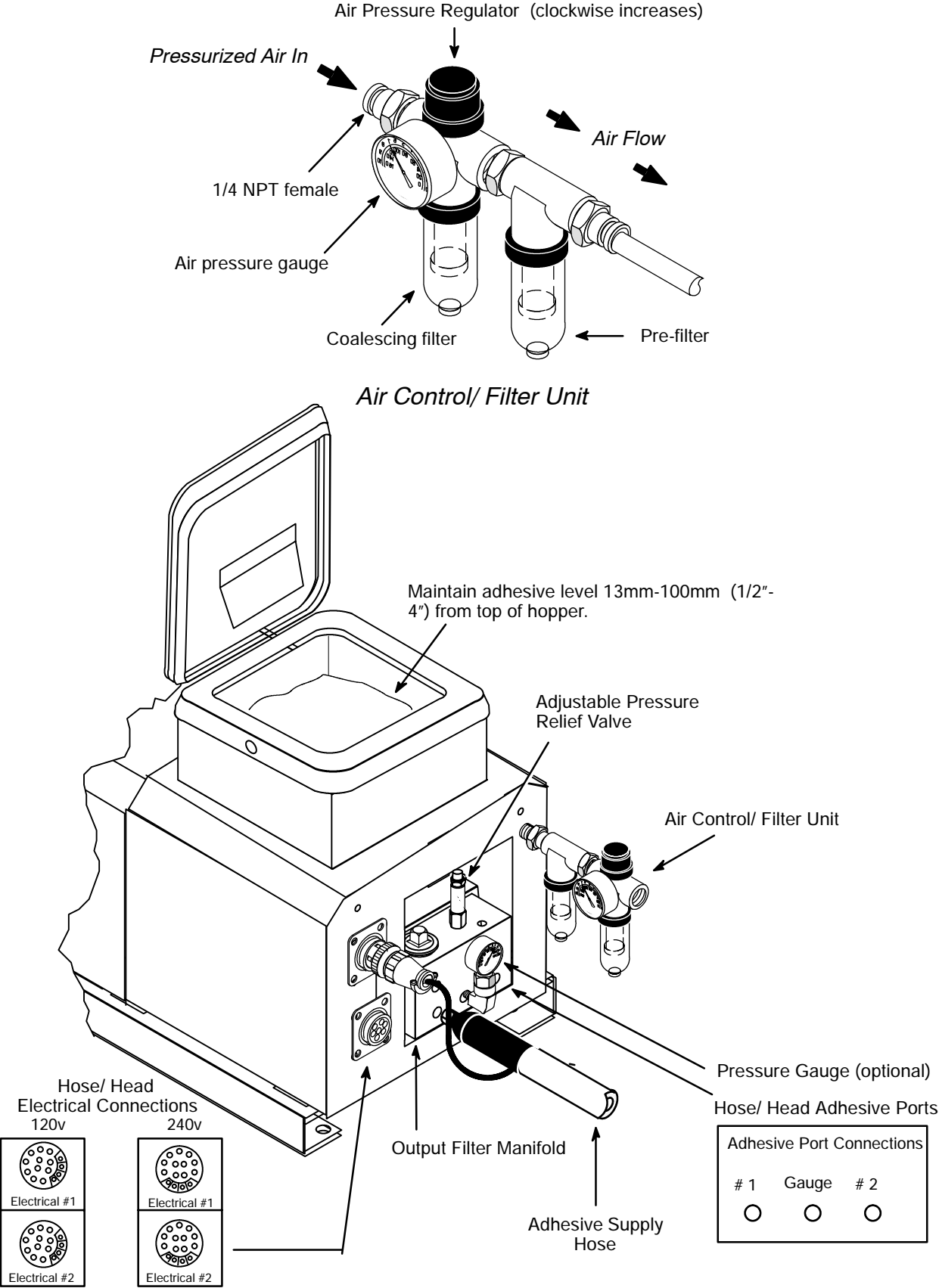


CAUTION: Using adhesive with viscosity over 50,000 centipoise could cause motor stall and/ or pump failure.

The adhesive level should be maintained at 13mm to 100mm (1/2" to 4") from the top of the hopper. Where applications demand a high output volume of adhesive, add small amounts of adhesive frequently. Adding large amounts of adhesive to an almost empty hopper will lower the temperature of the adhesive in the hopper and may cause the ASU to fall below its READY setpoint.

Changing the Adhesive Formula

If a different adhesive formulation from the one being currently used is needed, the system will have to be flushed if the two formulations are incompatible. See page 6-3 of this manual for the proper flushing procedure. When in doubt about adhesive compatibility, flush your system.



Rear Cover: Hose and Head Electrical and Adhesive Connections

Typical Start-Up and Shut Down of the DYNAMINI Application System

Start Up Procedures

1. Fill the ASU's hopper with clean hot-melt adhesive as described on page 3-4. Close the hopper lid immediately to prevent contaminants from falling in. (Cover your bulk supply of adhesive to prevent contaminants also.)
2. At the control panel, turn ON the Main Power Switch. The controller will perform its initial calibration cycle. The display will read "CAL". Each of the five temperature zone's LEDs will flash as a lamp test.
3. Program your adhesive setpoints (see instructions on page 5-2) or use the factory settings listed below. Allow adequate time (approximately 20-30 min.) for the adhesive to melt and the temperatures of the temperature zones to stabilize.

Note: When the ASU leaves the ITW Dynatec factory, it is programmed with the following factory settings (unless special factory settings were requested):

Hopper: 150°C (300°F)
Hose: 177°C (350°F)
Applicator: 177°C (350°F)
Sequential Startup: ON

4. Once the ASU has reached temperature, turn ON the Pump ON/ OFF Switch. The ASU will begin to pump adhesive.
5.
 - a. *On piston pump units:* use the air pressure regulator, located at the rear of the ASU, to regulate adhesive output.
 - b. *On gear pump units:* use the pressure relief valve, located on the filter outlet manifold, to regulate adhesive output.

Shut Down Procedures

1. Turn OFF the Pump Switch.
2. Turn OFF the Main Power Switch.

Storage and Disposal of the DYNAMINI Application System

Temporary Storage of the Unit

1. Flush the adhesive application system with flushing fluid (PN L15653), following the instructions detailed in chapter 6 of this manual.
2. Clean or replace both the output filter and the primary filter, following instructions detailed in chapter 6.
3. Shut OFF all pressure and power sources.
4. Release residual air pressure.
5. Remove all residual adhesive and wipe components clean.
6. Remove all air lines and all power supply cables.
7. Pack the unit in a corrosion-proof manner.
8. Store the unit in such a way that it is protected from damage.

Disposal of the Unit

1. Shut OFF all pressure and power sources.
2. Release residual air pressure.
3. Remove all residual adhesive.
4. Remove all air and adhesive supply hoses and all power supply cables.
5. Dismantle all components and sort into mechanical and electrical components.
6. Arrange for all components to be recycled.

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Adhesive Application Solutions

Chapter 4 DYNAMINI TEMPERATURE CONTROLLER SET-UP

Temperature Control Functions in General

The Dynamini temperature controller provides accurate temperature control for the hopper, hoses and applicators. Setpoints are programmed at the user-friendly, all-icon keypad. The controller will display an error message any time an open or shorted sensor condition occurs.

Defining Dynamini Temperature Control Terms

Adhesive Temperature Control Range

The temperature limits within which the ASU, hoses and applicators may be programmed and maintained.

Printed Circuit Board (PCB)

The Dynamini contains one pcb. It contains the central processing unit (CPU) of the microprocessor temperature control as well as providing control signals to, and monitoring signals from, the hopper, hoses and applicators. It features lighted LEDs to indicate that heater power is ON. The ASU's fuses are located on this board.

Dynamini Temperature Controller

The built-in control system that controls, monitors and displays all system temperature values of the Dynamini adhesive application system.

Mechanical High-Temperature Protection

A mechanical, redundant thermostat located on the hopper that will turn off the system above 232°C (450°F).

RTD Sensors

The Dynamini system uses 100-ohm platinum resistance temperature detector sensors for all temperature controls.

Sequential Startup

This feature allows the temperature zones to come on in sequence (hopper, followed by hose, followed by head). When activated, and the ASU is turned ON from a cold start, the hopper heats first. When the hopper is within the programmable tolerance of setpoint, the Head(s) and hose(s) begin to heat. No other features of the ASU are affected by sequential startup.

Note: sequential startup is rarely used. In most cases, it should be de-activated to ensure rapid warm up.

Setpoint

A programmable temperature that has been selected for hopper, hoses and applicators.

Setpoint Limitation

This is a universal maximum temperature for all zones (218°C [425°F]). The programmer cannot program a temperature setpoint higher than the setpoint limitation.

Stepped Function (Future feature, not on V2.0)

Used on systems with electric applicators only. After programming the temperature (to the softening point of your adhesive, see your adhesive manufacturer), the controller holds all electric heads at the operator-selected temperature for ten minutes before releasing them to operating setpoint. This feature allows for the stabilization of the electric valves.

Error Indication Messages

A controller display of “EO1” indicates that the selected zone (ie, a hose, applicator or the hopper) has an open sensor. A display of “EO2” indicates a shorted sensor.

If either alarm occurs, first verify that the following three connections are made correctly:

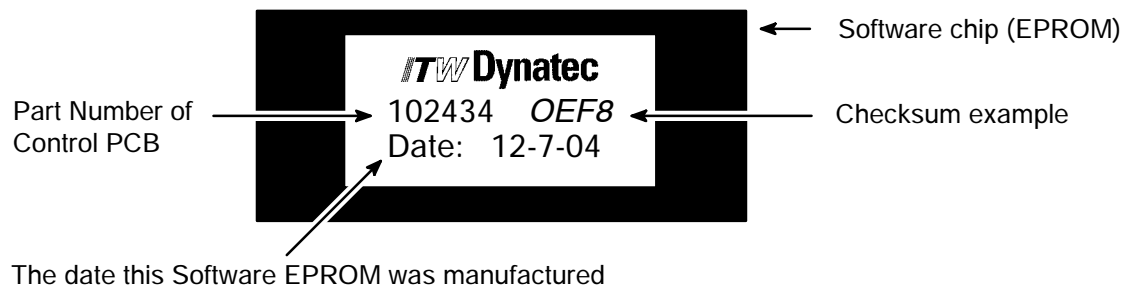
1. The ASU-to-hose connection(s) located at the back of the ASU,
2. The hose-to-applicator connection(s),
3. The RTD Input connections (X4) located on the Control Printed Circuit Board.

If the problem is not with a connection, check the sensor and replace if necessary.

Software Chip (EPROM) and Checksum

The software EPROM is on the Control Printed Circuit Board (see Ch. 7). Inscribed on the controller's software chip is information that is required if your controller needs service, including the controller's checksum.

Software chip example:



Settings for a Typical Operation

Note: The values given here are approximate settings for a typical packaging operation. The values you choose will be based on the type of equipment and adhesive you are using and the nature of your particular operation.

If Application Temperature is 163°C (325°F):

- Hose and head temperature: 177°C (350°F).
- Hopper setpoint temperature: 150°C (300°F).
- ASU operating range: 135°C to 177°C (275°F to 350°F).
- Mechanical thermostat (for the hopper) over-temperature: 232°C (450°F)

System Values That Are Permanently Programmed

- Minimum setpoint value: 40°C (100°F).
- Maximum setpoint value: 218°C (425°F).

System Values as Programmed by the Factory

ITW Dynatec can set the controller's system values to customer's specs, if provided.

If customer's specs are not provided, the following values will be entered into the Dynamini temperature controller at the factory. They may be changed by reprogramming through the keypad. (These are not the "default" settings, see following section).

- Temperature scale: displayed in degrees Fahrenheit.
- Applicator (head) and hose setpoints: 177°C (350°F).
- Hopper setpoint: 150°C (300°F).
- All zones are switched off, except for the hopper.

Default Settings of the Controller

Default settings are the manufacturer's preset values to which the system will return if the Dyna-mini temperature control is subjected to an internal memory reset. While you can change your programmed values to anything within the system's limits, the default settings cannot be changed.

To cause an internal memory reset (ie, to restore the defaults) of a temperature zone, turn that temperature zone ON and then OFF.

Defaults

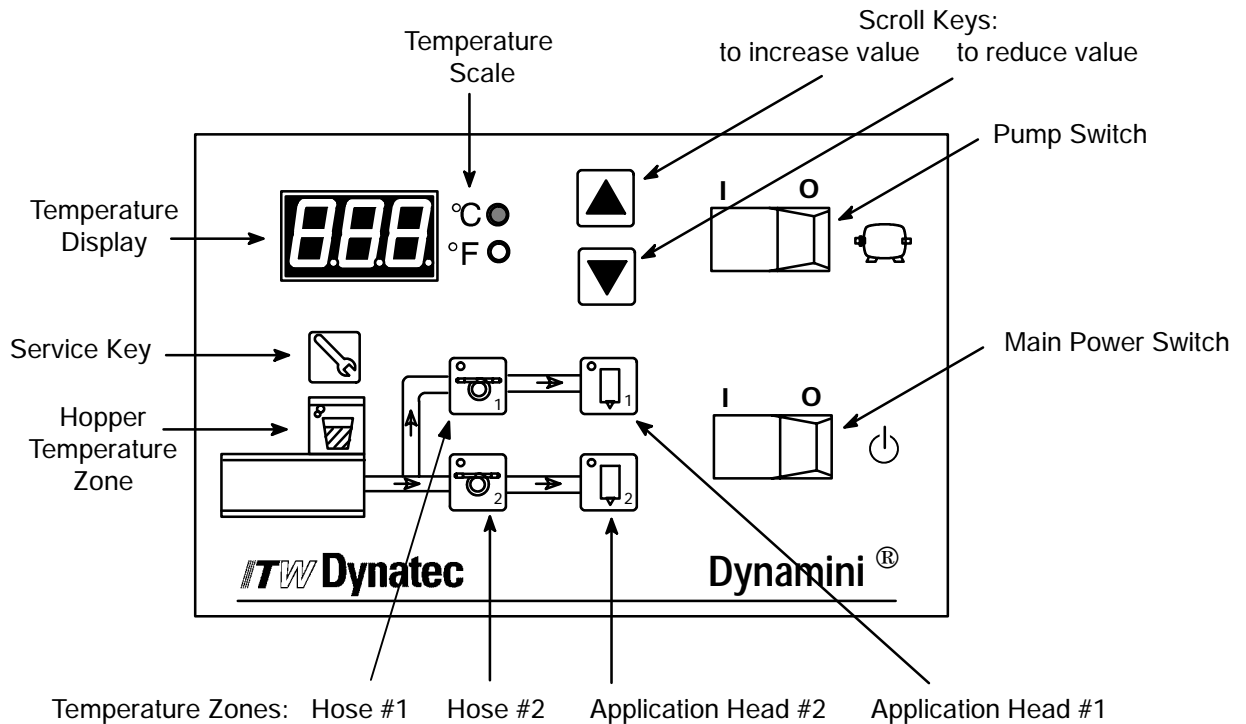
- Temperature setpoint for each zone: 93°C (200°F).
- Sequential Startup: SSO (OFF)

Helpful Tips for the User

- When the ASU is turned on, all temperature setpoints and other operating parameters will be exactly where they were when the ASU was turned off.
- When the ASU is turned on, all system heaters go on unless they have previously been set below 40°C (100°F).

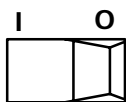
Chapter 5 PROGRAMMING INSTRUCTIONS FOR DYNAMINI™ CONTROLLER

Dynamini Keypad



Programming

Turn controller ON



Turn ON the main power switch.
System will go through its self-diagnostics (CAL).
Temperature zone LEDs will flash.



Controller will display "SS 1" (On) or "SS 0" (Off) to indicate status of the Sequential Statup feature (see info on "Sequential Startup" later in this chapter).

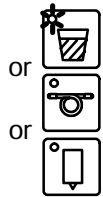


or



Controller will display it's software version, ie.
V.2.XX

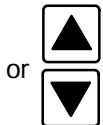
Programming temperature setpoints



or

or

Choose a temperature zone.



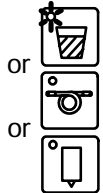
or

Scroll to "increase value" or "reduce value", in order to adjust the setpoint temperature.

After two seconds the display will read the actual temperature. The setpoint is stored.



Turning temperature zones ON/OFF



or

or

Choose a temperature zone.



Scroll to "reduce value" until temperature setpoint is 0. The temperature zone is now turned OFF.



To turn ON the temperature zone, increase the setpoint.



Error indication messages

The temperature sensor is open or has high resistance.



The temperature sensor is shorted or has low resistance.



Keypad Locking

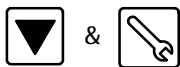
It is possible to lock or unlock the controller in order to restrict programming changes. To change the code which is necessary to over-ride or unlock the keypad lock, see Service Functions.

Note: the ASU is shipped with de-activated keypad lock. If the keypad lock must be used, an access code must be programmed prior to locking the keypad.

Locking or Unlocking the Keypad

Important Note: the controller must be in the Temperature Display mode in order to allow locking or unlocking of the keypad.

Locking the Keypad



Press the Down Scroll key, then hold and press the Service icon key.

You will see "Loc" to indicate that the Keypad Lock is active.

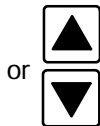


Unlocking the Keypad



Press the Down Scroll key, then hold and press the Service icon key.

You will see "Cod" to indicate that the access code is required.



or

Enter your access code by scrolling up or down. Default code = " - - -".



Confirm your code input by pressing Tank key.

Notes:

1. Once the keypad lock is active, unauthorized programming is not possible, even after turning the ASU OFF, then back ON again.
2. Once the keypad lock is unlocked, programming is possible until the ASU is turned OFF, then back ON or the keypad is locked again.
3. If the keypad must be unlocked permanently, the access code must be de-activated in the Service Functions.

Service Functions

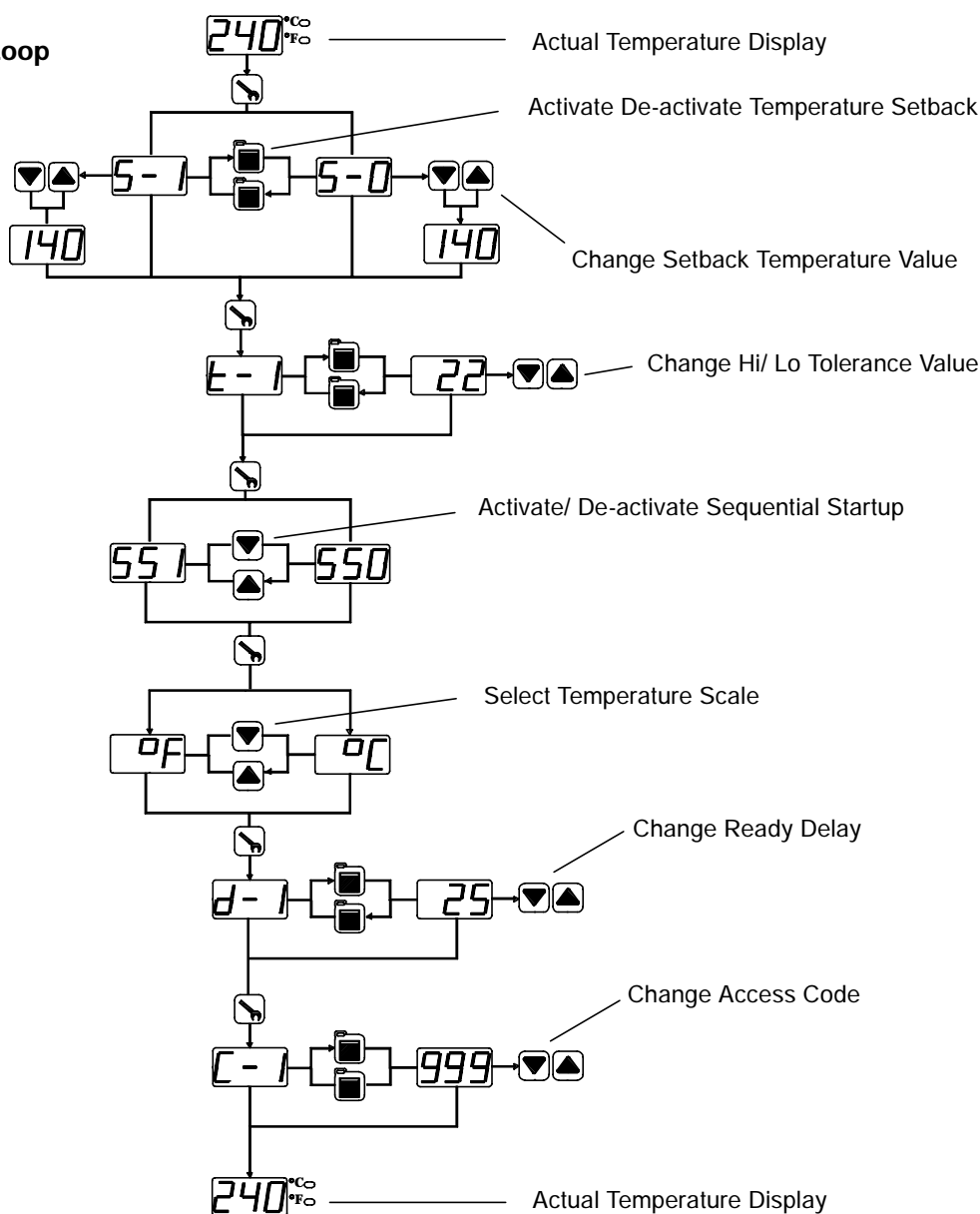
After the basic programming of Temperature Setpoints is complete, the programmer proceeds to programming of the Service Functions, if desired.

The Service Functions are a continuous loop of programming steps ("functions") which the programmer moves through by pressing the "Service" key. These steps are described in this section of the chapter. The Service Functions loop and basic programming is diagrammed below.

There are three ways to exit the Service Functions loop:

1. Just wait (approx. 10 seconds) and the controller will automatically return to the actual temperatures display,
2. Press the Service key until you are back to the actual temperatures display, or
3. Press any Hose or Head key and you will return to the actual temperatures screen.

Diagram of the
Service Functions Loop



Service Functions, cont.

Standby Programming

“Standby” is a temperature value by which all temperature zones will lower when Standby mode is activated. For example, if your temperature setpoints are all 300 degrees, and you program a 100 degree Standby, then the Standby temperature of all zones will be 200 degrees. Similarly, if your temperature zones setpoints vary, and you program a 100 degrees Standby, each zone’s Standby temperature will be 100 degrees lower than its setpoint.



Press Service icon to enter Service Functions.

You will see either “S-1” (standby is On) or “S-0” (standby is Off).



or



Press the Tank icon to activate/ de-activate Standby.



If desired, you may set the Standby temperature by scrolling up or down to desired temperature.



When programming is complete, wait a few seconds and the controller will return to the ASU’s actual temperature.

Note: When Standby is active, the display will alternate between the ASU’s actual temperature and S-1.

Service Functions, cont.

To Set Tolerance (Hi & Low Temperature Limits)

The Tolerance (high/ low alarm) setpoint is a range (+ and - the zone's temperature setpoint) between which your ASU can safely operate. It's lower temperature represents the ASU's ready temperature. It's upper value represents the over-temperature point.

Setting the Tolerance range, for example: if the temperature setpoint is 200 degrees, and the Tolerance setpoint is 10 degrees, then the high alarm (overtemp) equals 210 degrees and the low alarm (ready temp) equals 190 degrees.



Press the Service icon twice to select the Tolerances of your temperature zones. An display of "t-1" indicates the Tolerance function has been selected.



Press the Tank button to display the Tolerance.



or

Use the scroll buttons to change the Tolerance range for all zones. Note: your Tolerance range must be a value between ± 50 degrees for Fahrenheit (± 27 degrees for Celsius).

When Tolerance programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Turning Sequential Startup ON/OFF

The Sequential Startup feature programs the order in which the temperature zones will come on at startup. A Sequential Startup of "SS1" (On) means the tank will begin heating first, then, when the tank is ready, the other zones will begin heating. A Sequential Startup of "SS0" means Sequential Startup is Off and all zones will begin heating immediately.



Press the Service icon three times to set Sequential Startup.

The display will flash either "SS1" (sequential startup is ON) or "SS0" (sequential startup is OFF).



or



or

Scroll to choose between ON and OFF. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

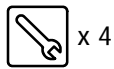


Note: Any time the ASU is switched ON, you will briefly see "SS1" or "SS0" displayed.

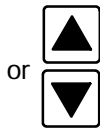
Service Functions, cont.

To Set Temperature Scale

The Temperature Scale may be set to display temperature either in degrees Celsius or Fahrenheit.



Press the Service icon four times to set the Temperature Scale.



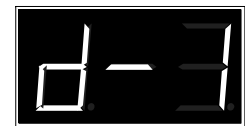
Scroll to choose between Celsius ("C") or Fahrenheit ("F") as indicated by the Temperature Scale LED. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

To Set Ready Delay

When the system is ready (all temperature zones are within tolerance), a ready delay may be programmed to delay the system's ready output signal.



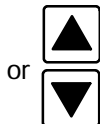
Press the Service icon five times to set a Ready Delay.



You will see "d-1" to indicate you are in Ready Delay programming mode.



Press the Tank icon to display the Ready Delay.



To change a Ready Delay, scroll up or down to the desired length (in minutes) of delay.

0 = Default, no delay

99 minutes = maximum length of delay

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Service Functions, cont.

To Change Access Code (De-activate Keypad Locking)



x 6

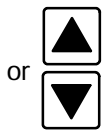
To change the Access Code, press the Service icon six times.



You will see "C-1" to indicate you are in Access Code programming mode.



Press the Tank icon to see the programmed Access Code. For example, "999".



To change the Access Code, scroll up or down to the desired numeric value.



"- - -" = no Access Code (Access code is de-activated),

"- - -" = no Keypad Locking

1 - 999 = possible Access Code values

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Controller Features

System Ready Indicator Light

When not in programming mode, a flashing temperature scale light (LED) indicates that the ASU is not “Ready” for production. This LED will cease to flash when all temperature zones are within the programmed temperature tolerance window.



Error Indication Messages

“EO1” = the temperature sensor is open (no sensor attached) or has high resistance.



“EO2” = the temperature sensor is shorted or has low resistance.



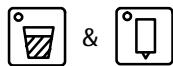
To Copy and Paste Setpoints

The Copy/ Paste feature of the controller copies the tank setpoint and pastes it as the setpoint of other temperature zones. The paste will apply to only temperature zones that are switched ON.

Set your Tank setpoint as described earlier in this chapter.



Push and hold the Tank icon. While holding, press the #1 Hose icon. Release.



Push and hold the Tank icon again. While holding, press the #1 Head icon. Release.

The manually programmed setpoint has now been pasted in to all turned on hose and head zones. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

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An Illinois Tool Works Company



Adhesive Application Solutions

Chapter 6 PREVENTIVE MAINTENANCE

Note: Re-read Chapter 1 “Safety Precautions” before performing any maintenance procedures. All maintenance procedures must be performed by qualified, trained technicians.

General Cleaning

Follow the manufacturer’s directions when using industrial cleaners on the enclosure.

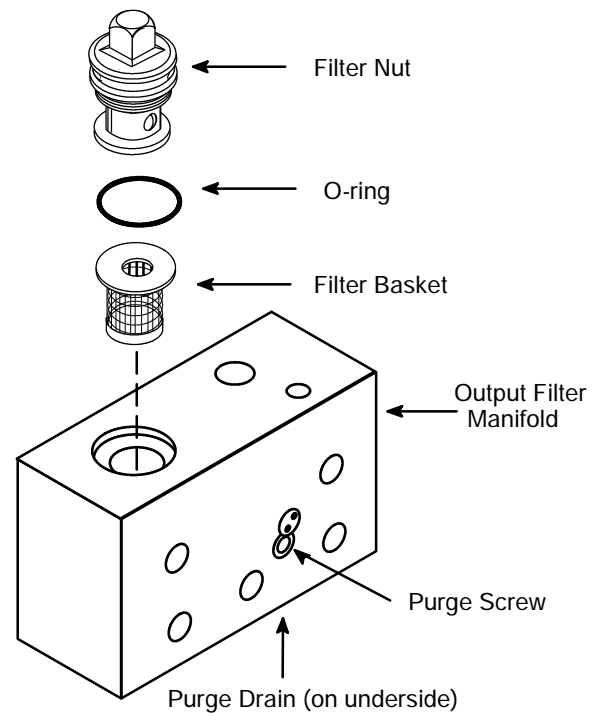
Preventive Maintenance

Output Filter

During the first weeks of operation, the output filter must be replaced monthly.

To replace the output filter:

1. Follow instructions “Purging the Filter Manifold of Adhesive and Pressure”, page 6-2.
2. Unscrew and remove the filter nut (15.8 mm or 5/8” nut).
3. With pliers, pull the filter basket out.
4. Replace the o-ring on the filter nut. Apply o-ring lubricant (PN N07588) to the new o-ring.
5. Replace the filter basket.
6. Apply anti-seize to the threads of the filter nut and re-install. Tighten the filter nut until it is seated firmly, taking care not to cut the o-ring.



Hose Fittings & Fasteners

Periodically check all hose fittings and screws for tightness.

Hopper Filter Inspection & Cleaning

The hopper filter is a coarse screen located in the bottom of the hopper. It fits over the hopper's drain hole and prevents any large debris from leaving the hopper.

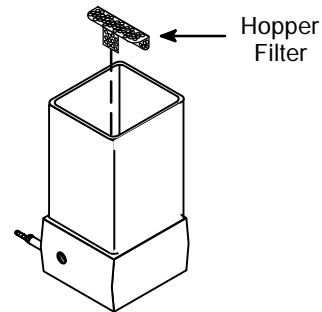
1. Pump all adhesive out of the ASU.
2. Open the hopper lid and inspect the hopper filter.
3. If cleaning the filter is necessary, lower the temperature of the hopper 20-30°C (35-50°F) from operating temperature.



WARNING HOT SURFACE

The ASU will still be hot during this procedure. Use insulated gloves and protective clothing when handling the hopper filter.

4. Use a hook to pull the hopper filter out.
5. Immerse the clogged filter in flushing fluid (PN L15653), then use a hot air gun and rags to clean it.
6. Re-insert the filter into the hopper.
7. Refill the hopper and resume production.



Purging the Filter Manifold of Adhesive and Pressure

As a safety precaution, purge the filter manifold before changing the output filter or before removing any of the hoses or applicators from their manifold port.

Refer to the illustration on page 6-1 while following these instructions.



HIGH PRESSURE

During the purging procedure, hot adhesive can come out of the manifold under high pressure. Wear safety glasses, gloves and protective clothing. Stand clear of the ASU until all pressure is relieved.



HOT ADHESIVE

Avoid splashing hot adhesive. Position a heat-resistant container under the manifold's purge drain before proceeding.

1. The system should be at operating temperature. Turn the pump/ motor OFF.
2. With a hex key screwdriver (allen wrench), slowly loosen the purge screw (do not remove it). Allow the adhesive and pressure to escape. All the adhesive will flow into the heat-resistant container.
3. Re-tighten the purge screw.

Flushing the System

Contaminated adhesive, accumulation of residue, or changing the adhesive formulation may require the system to be flushed. At least 6 liters (1.5 gallons) of flushing fluid is required (PN L15653).



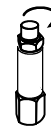
WARNING

The flushing fluid will splash easily. Wear protective clothing, gloves and goggles to prevent severe burns.

1. Pump out as much of the molten adhesive as possible.
2. Reduce the pump pressure to zero by first turning the pump switch to OFF. Then open the purge screw, following the instructions given in "Purging the Filter Manifold of Adhesive and Pressure" on page 6-2.
3. Disconnect one of the supply hoses' adhesive feed from its applicator head. Do not disconnect electrical power to the head. Put the hose in a secured position within a container to catch the used flushing fluid.
4. Add flushing fluid to the hopper and allow approximately fifteen minutes for it to reach hopper temperature. Carefully stir the flushing fluid to mix with any remaining adhesive.
5. *For Piston Pumps:* Slowly turn the air pressure regulator clockwise.
For Gear Pumps: Slowly turn the pressure relief control valve clockwise.
6. Pump about half of the fluid into the container.
7. *For Piston Pumps:* Turn the regulator counter-clockwise.
For Gear Pumps: Turn the motor OFF.
8. Remove the output filter and replace the basket. Install a new o-ring on the filter nut (lubricate the new o-ring with o-ring lubricant prior to installation) and tighten the brass nut.
9. Add new adhesive to the hopper and heat to application temperature.
10. *For Piston Pumps:* Slowly turn the air pressure regulator clockwise.
For Gear Pumps: Turn the motor ON.
11. Actuate each applicator until all flushing fluid is removed and a steady stream of new adhesive flows.
12. *For Piston Pumps:* Re-adjust the pump air pressure for desired flow.
For Gear Pumps: Re-adjust the pressure relief for desired flow.
13. Re-fill the hopper and resume production.



Pressure
Regulator



Pressure
Relief Valve

ITW Dynatec
An Illinois Tool Works Company





Adhesive Application Systems


Chapter 7 TROUBLESHOOTING

General Troubleshooting Notes

Note: Re-read Chapter 1 "Safety Precautions" before performing any troubleshooting or repair procedures. All troubleshooting or repair must be performed by qualified, trained technicians.

	DANGER HIGH VOLTAGE		WARNING HOT SURFACE
<p>Dynamini systems use electrical power that can be life threatening and hot-melt adhesives that can cause serious burns. Only qualified persons should perform service on the Dynamini system.</p>			

Handling Printed Circuit Boards (PCBs)

	DANGER HIGH VOLTAGE <p>Before unplugging connectors from the I/O PCBs, ground yourself to the ASU by touching any available unpainted cool metal surface, mounting screws, etc. This will avoid electrical discharge to the PCB assembly when you are removing and replacing connectors.</p>
--	--



CAUTION: Printed circuit boards (PCBs) should be handled using the following procedures:

1. Wear a wrist grounding strap. If a grounding strap is not available, frequently touch a bare metal part of the ASU (unpainted frame, mounting screw, etc.) to safely discharge any electrostatic buildup on your body.
2. Handle a PCB by its edges only. Don't grip a PCB across its surface.
3. When removed from the ASU, each PCB must be individually packaged inside a metallized, static drain envelope. Do not place the removed PCB on a table, counter, etc. until it has first been placed in or on a static drain envelope.
4. When handing a PCB to another person, touch the hand or wrist of that person to eliminate any electrostatic charge *before* you hand the PCB to him.
5. When unwrapping a PCB from its static drain envelope, place the envelope on a *grounded, nonmetallic* surface.
6. To cushion PCBs for shipment, use only static-drain bubble pack. Do not use foam peanuts or bubble pack not known to be static draining.

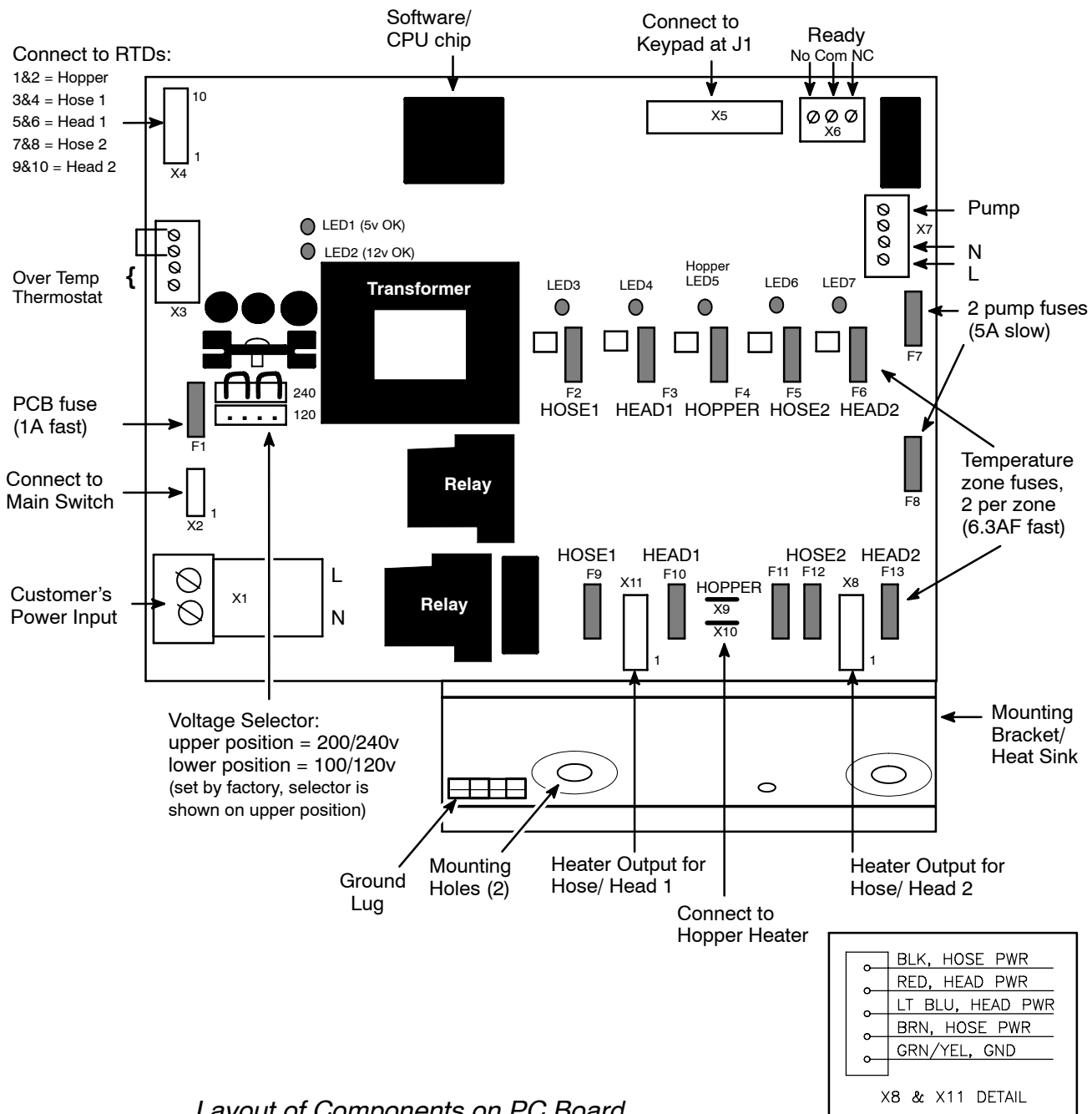
Printed Circuit Board

The PC board contains the controller's software/ CPU chip and non-volatile memory.

The green, temperature zone LEDs cycle on and off as each heater outputs.

The PCB is mounted under the ASU's cover.

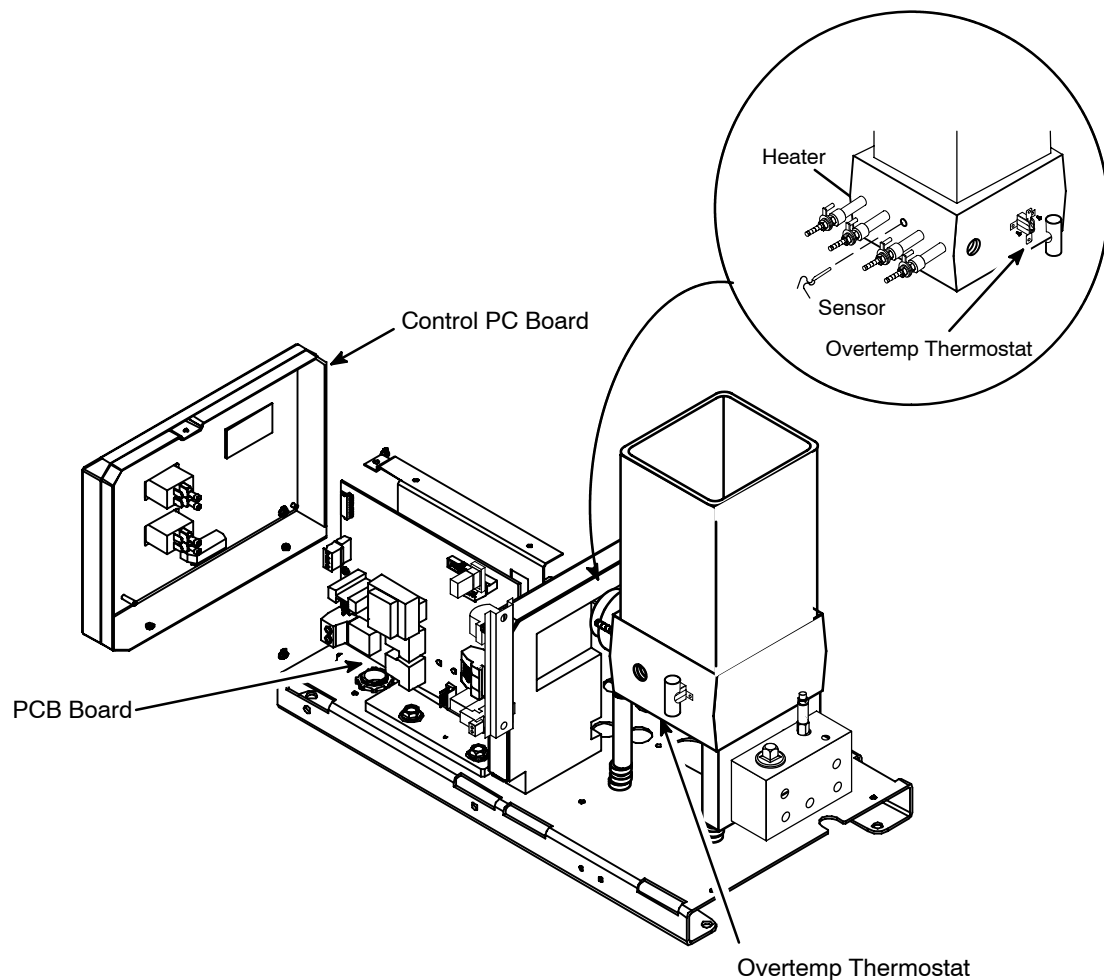
The fuses are designated F1 thru F13 below. See diagram for sizes. The fuses are the only replaceable parts on the pc board. Each temperature zone is fused with two fuses.



Layout of Components on PC Board

Overtemp Thermostat

The overtemp thermostat cuts off power to all temperature zones if the tank temperature exceeds 224°C (435°F). The overtemp thermostat must be re-set manually, by opening the ASUs front panel and pressing the reset button in the center of the overtemp switch (note: the reset button is protected by a plastic insulator).



Location of Printed Circuit Boards and Overtemp Thermostat

Resistance Tables

Temperature		Resistance in Ohms
°F	°C	
32	0	100
50	10	104
68	20	108
86	30	112
104	40	116
122	50	119
140	60	123
158	70	127
176	80	131
194	90	135
212	100	139
230	110	142
248	120	146
268	130	150
284	140	154
302	150	157
320	160	161
338	170	164
356	180	168
374	190	172
392	200	176
410	210	180
428	220	183

Temperature Sensor Resistance

Hose Length		Resistance in Ohms	
Meters	Feet	120V	240V
1.2	4	102-125	400-490
1.8	6	63-77	291-355
2.4	8	50-61	204-249
3	10	39-48	155-189
3.7	12	31-37	125-153
4.9	16	23.6-29	98-120
7.3	24	N.A.	61-75

*Nominal Hose Heater Resistance
for DynaFlex Hoses*

Watts	Resistance in Ohms	
	120V	240V
200	72	288
270	53	213
350	41	165
500	29	115
700	N.A.	82

Nominal Head Heater Resistance

Qty. Heaters	2
Resistance in Ohms for each heater	25

Nominal Hopper Heater Resistance

Note: Resistance is measured at ambient temperature (20°C/ 68°F).

Troubleshooting Guide

Preliminary Checks: Verify the following before proceeding

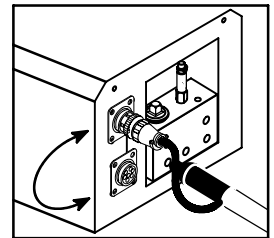
1. The ASU is switched on.
2. The ASU is supplied with power.
3. The ASU is supplied with pneumatic air.
4. Pneumatic and electrical connections are correct.
5. Adhesive is in the hopper.

Error Messages (see also Chapter 4)

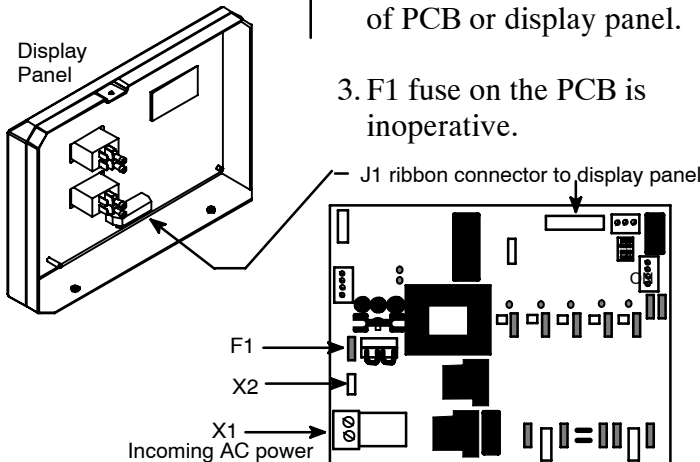
- EO1 = temperature zone has an open sensor
EO2 = temperature zone has a shorted sensor

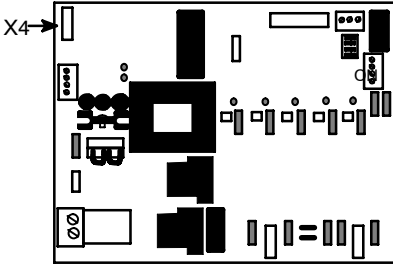
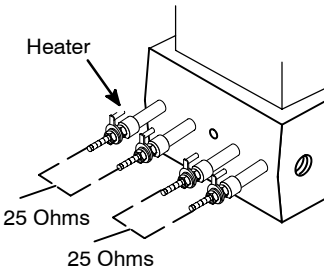
Hose/ Applicator Troubleshooting Tip

Hose or applicator problems can be isolated by electrically connecting the applicator and hose to an alternate socket on the ASU. If the malfunction goes with the applicator and hose, the problem will usually be in the applicator or hose that was moved. If the malfunction does not move with the applicator and hose, the problem is probably in the ASU.

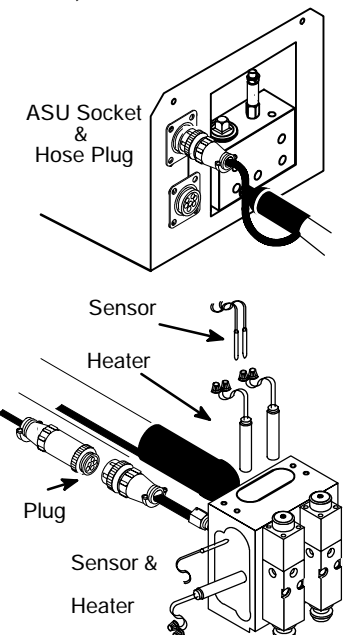


Problem	Possible Cause	Solution
Controller setpoints are not adjustable.	<ol style="list-style-type: none"> 1. Main Power switch OFF. 2. PCB inoperative. 3. Keypad locked. 	<ol style="list-style-type: none"> 1. Switch ON. 2. Replace PCB. 3. Unlock.
All channels display error message or wrong actual temperatures.	<ol style="list-style-type: none"> 1. PCB inoperative. 	<ol style="list-style-type: none"> 1. Replace PCB.
System is not working, display is OFF.	<ol style="list-style-type: none"> 1. Power supply plug at X1 is not plugged in. 2. Ribbon connector J1 is disconnected from back of PCB or display panel. 3. F1 fuse on the PCB is inoperative. 	<ol style="list-style-type: none"> 1. Check power supply plug connection. 2 Check connection. 3. Insert new fuse, if it blows, the PCB is inoperative.



Problem	Possible Cause	Solution
<p>Hopper temperature is higher than setpoint (overtemp).</p> 	<ol style="list-style-type: none"> 1. Hopper sensor not fully inserted. 2. Hopper sensor (X4) inoperative. 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Check hopper sensor. 2. Replace hopper sensor if resistance does not comply with resistance table. 3. Replace PCB.
<p>Display for Hopper = EO1.</p>	<ol style="list-style-type: none"> 1. Plug connection X4 on PCB is loose. 2. Temperature sensor inoperative. 	<ol style="list-style-type: none"> 1. Restore connection. 2. Replace sensor if resistance does not comply with resistance table.
<p>Display for Hopper = EO2.</p>	<ol style="list-style-type: none"> 1. Hopper sensor short circuit. 2. Short circuit at plug connection X4 on PCB. 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Replace sensor if resistance does not comply with resistance table. 2. Check and eliminate short circuit. 3. Replace PCB.
<p>Hopper does not heat, but LED is ON.</p> 	<ol style="list-style-type: none"> 1. Hopper fuses (F4 & F11) inoperative on PCB. 2. Hopper heater element is inoperative. 3. Disconnection in hopper heater circuit. 4. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Insert new fuse(s) and observe ASU. If fuse(s) blows again, check for a short circuit in heater. 2. Replace hopper if element's resistance does not comply with resistance table. <i>Note: remove wires from both heater elements when measuring.</i> 3. Check and repair (see wiring diagram). 4. Replace PCB.

Problem	Possible Cause	Solution
Hopper does not heat, and LED is OFF.	1. Inoperative Control PCB.	1. Replace PCB.
Hose (or Head) is not heating. Hose (or Head) LED on the PCB is ON. Fuses: F2 & F9 = Hose 1 F3 & F10 = Head 1 F5 & F12 = Hose 2 F6 & F13 = Head 2	1. Disconnection between ASU and Hose (or between Hose and Head). 2. Hose (or Head) fuse(s) on the PCB is inoperative. 3. Loose plug connection on PCB. 4. Heating element inoperative.	1. Check plug connections. 2. Insert new fuse(s). If fuse blows again, check for a short circuit in heater. 3. Check connectors X8 and X11 and restore connection. 4. Check resistance and compare to resistance table. a. For head: if heater cartridge is inoperative, replace heater. b. For hose: if heating element is inoperative, replace hose.
Hose (or Head) is not heating. Hose (or Head) LED on the PCB is OFF.	1. Inoperative PCB. 2. Sequential Startup is active.	1. Replace PCB. 2. Wait until hopper has reached setpoint or re-program the heat-up mode (see pg. 5-6).
Hose (or Head) actual temperature is much higher than setpoint.	1. Inoperative Hose (or Head) triac on PCB (corresponding PCB LED is OFF). 2. Inoperative Hose (or Head) temperature sensor (corresponding PCB LED is ON).	1. Replace PCB. 2. Check resistance and compare to resistance table. a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose.

Problem	Possible Cause	Solution
<p>Display for Hose (or Head) = EO1</p>  <p>The diagram illustrates the ASU (Air Supply Unit) components. The top part shows the ASU Socket & Hose Plug connection. The bottom part shows the internal components: a Sensor, a Heater, a Plug, and a Sensor & Heater assembly.</p>	<ol style="list-style-type: none"> 1. No Hose (or Head) is connected. 2. Disconnection between ASU and Hose (or between Head and Hose). 3. Disconnection at X4 on PCB. 4. Hose (or Head) sensor is inoperative. 	<ol style="list-style-type: none"> 1. Connect Hose (or Head) if needed. If not needed, ignore display. 2. Check plug connection. 3. Make proper connection. 4. Check resistance and compare to resistance table. <ol style="list-style-type: none"> a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose.
<p>Display for Hose (or Head) = EO2</p>	<ol style="list-style-type: none"> 1. Hose (or Head) sensor short circuit. 2. Short circuit in plug connection between ASU and Hose (or between Hose and Head). 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Check resistance and compare to resistance table. <ol style="list-style-type: none"> a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose. 2. Make proper connection. 3. Replace PCB.

Pump Operation & Adjustable Pressure Relief

When the ASU's hopper reaches setpoint, the controller places the hopper in "Ready" condition and power is supplied to the pump.

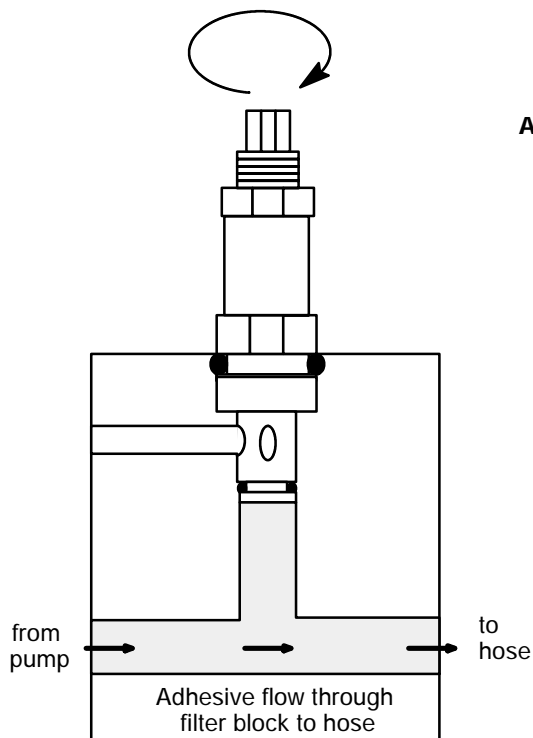
An adjustable pressure relief valve is located on the output filter manifold.

When adhesive pressure exceeds the set limit, adhesive flows back to the hopper. Therefore, the greater the setting on the pressure relief valve, the greater the adhesive output.

To change the setting of this valve, loosen the lock nut and turn the adjustment screw clockwise to increase pressure or counterclockwise to decrease pressure. The relief valve is factory set at 27 bar (400 psi) for gear pumps and 68 bar (1000 psi) for piston pumps.

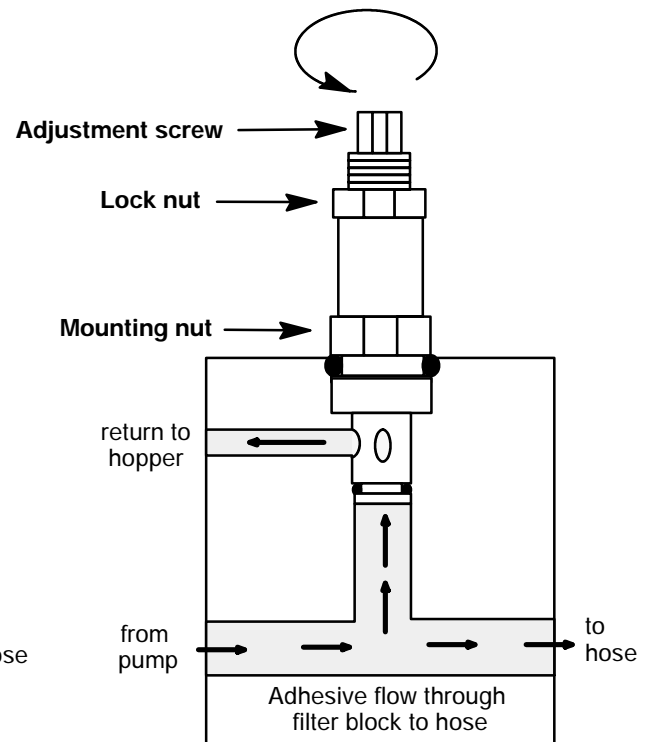
Normally Closed (Unrelieved):

In the drawing below, the valve is closed.



Open (Relieved):

In this drawing, pressure has exceeded the setting of the valve, causing the valve to open and discharge adhesive to the hopper.



Operation of the Adjustable Adhesive Pressure Relief Valve

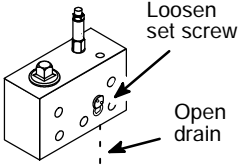
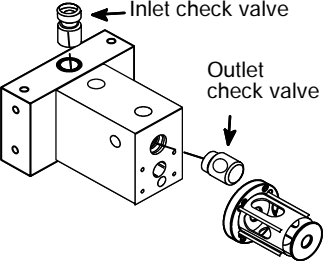
Piston Pump Troubleshooting Guide



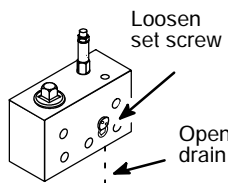
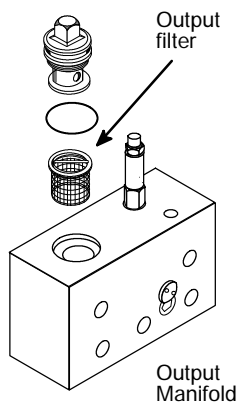
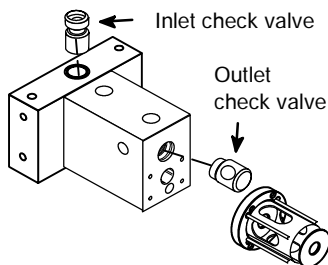
WARNING HOT SURFACE & ADHESIVE

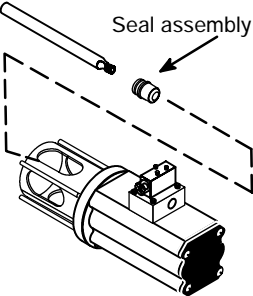
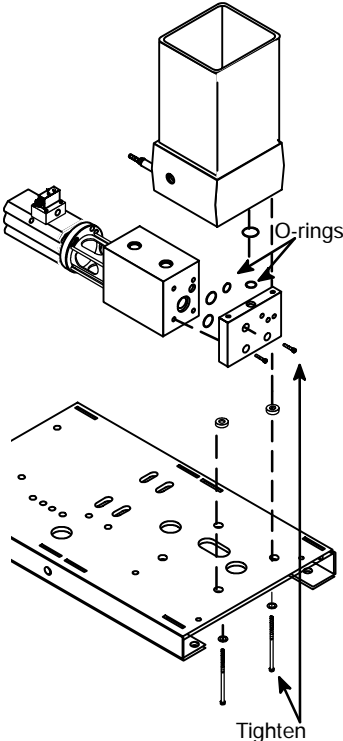
Some of the procedures in the following Troubleshooting Guide require working near hot adhesive. Be sure to wear protective gloves, safety glasses and clothing and use proper tools for handling hot melt components.

Problem	Possible Cause	Solution
<p>Pump Will Not Stroke</p>	<ol style="list-style-type: none"> 1. No air pressure. 2. 3-way solenoid valve is closed. 3. Fault in compressed air fitting on ASU. 4. Hopper temperature not ready. 5. Inoperative air valve (on back end of pump air cylinder). 6. Inoperative air cylinder 4-way solenoid valve. 7. System is not ready. 	<ol style="list-style-type: none"> 1. Verify system has been provided with at least 0.5 SCFM of air at 20-100 PSIG (.014 std. cubic meters/minute at 6.8 bar). 2. Verify that valve is properly connected (electrically) inside ASU. Verify that valve is properly connected to Air Control/ Filter Unit. Disconnect valve electrical leads and verify that air is passed through when 240 VAC is applied to the valve terminals. Replace valve if defective. 3. Inspect the system for improper connections, loose tubing or fittings, or kinked tubing. Repair or replace tubing or fittings as necessary. 4. Air valve cannot pass air until hopper has reached setpoint window. Wait until this has occurred. Check also the programming of the ready time delay. The default for this is "0". 5. Remove air valve from pump. Inspect, clean and repair as necessary. 6. Remove 4-way valve. Inspect, clean and repair as necessary. 7. Wait until temperature scale (F/C) light is steady ON (not flashing).

Problem	Possible Cause	Solution
<p>Pump Quick-Stroke in Both Directions</p>  <p>Loosen set screw Open drain</p>  <p>Inlet check valve Outlet check valve</p>	<ol style="list-style-type: none"> 1. No adhesive in hopper. 2. Adhesive too cold to flow into pump. 3. Adhesive used is too viscous. 4. Pump needs priming. 5. Problem with pump shaft piston. 6. Large opening in system downstream of pump. 	<ol style="list-style-type: none"> 1. Verify that hopper has an adequate level of hot melt adhesive. 2. Check ready temperature to make sure there has been enough time for the adhesive to rise to the hopper setpoint temperature. 3. Verify that adhesive selection and hopper setpoint temperature are compatible and that both are appropriate for your application. 4. Prime the pump by first lowering the air pressure, then letting the pump cycle very slowly until primed. 5. Remove the shaft and piston from the pump. See Chapter 8 for disassembly/ assembly procedures. Verify that piston diameter is correct: 19.63mm to 19.66mm (0.773" to 0.774") and that piston is tightly assembled to end of shaft. 6. Inspect system for open filter drain, disconnected or ruptured hose, or disconnected head. Repair as necessary.
<p>Pump Quick-Stroke on the Forward-Stroke Only (shaft moving into pump body)</p>	<ol style="list-style-type: none"> 1. Inlet check valve blocked open. 	<ol style="list-style-type: none"> 1. Clean inlet check valve. This may be possible without removing the pump by cleaning debris through the pump inlet hole at bottom of hopper.

Problem	Possible Cause	Solution
<p>Pump Motion on the Forward Stroke (shaft moving into pump) is very slow or stopped.</p>	<p>1. Outlet check valve is blocked closed.</p>	<p>1. Clean outlet check valve.</p>
<p>Pump Quick-Strokes on the Reverse Stroke (shaft moving out of pump)</p>	<p>1. Outlet check valve is blocked open.</p>	<p>1. Clean outlet check valve.</p>
<p>Low or Inconsistent Adhesive Output</p>	<p>1. Output filter clogged.</p> <p>2. Adhesive used is too viscous.</p> <p>3. Blocked hose.</p> <p>4. Blocked applicator heads.</p> <p>5. Pressure relief valve in output block is opening.</p>	<p>1. Remove and inspect output filter. Clean or replace as necessary. See Chapter 6 "Preventive Maintenance" for procedure.</p> <p>2. Verify that system components are at proper temperature and that selected adhesive is correct for your application.</p> <p>3. Inspect hose for kinks, internal plugs of debris or char (degraded adhesive). Clean or replace hoses as required.</p> <p>4. Inspect heads for plugged nozzles, proper air valve operation or plugged filters. Clean or repair heads as needed.</p> <p>5. Verify that air supplied to pump is less than 6.8 bar (100 PSIG). If relief valve is opening with air pressure less than 6.8 bar (100 PSIG), remove pump and replace pressure relief valve.</p>
<p>Adhesive Leak at Filter Drain Spout</p>	<p>1. Filter drain valve not tightly closed.</p> <p>2. Filter drain valve blocked open.</p>	<p>1. Close and tighten filter drain valve.</p> <p>2. Remove filter plug assembly from output manifold, clean and re-install.</p>



Problem	Possible Cause	Solution
<p>Adhesive Leak at Pump Shaft Seal</p> 	<ol style="list-style-type: none"> 1. Pump seal out of proper position inside air motor assembly. 2. Seal inoperative. 	<ol style="list-style-type: none"> 1. Remove seal from air motor and inspect it. Replace worn or damaged seal. Be sure there are no burrs or other sharp edges on pump shaft or on installation tools that could damage the new seal. 2. Remove seal from air motor and inspect it. Replace worn or damaged seal. Be sure there are no burrs or other sharp edges on pump shaft or on installation tools that could damage the new seal.
<p>Adhesive Leak at Pump-Mounting Block Interface</p> 	<ol style="list-style-type: none"> 1. Pump assembly nuts missing or loose. 2. Inoperative mounting block o-ring(s). 3. Helicoil insert pulled out of hopper. 	<ol style="list-style-type: none"> 1. Verify that both pump nuts are tightly assembled to the pump mounting block thru the base plate with the proper hi-collar washer. 2. Inspect the three o-rings and replace if worn or damaged. Be sure there are no burrs or other sharp edges in the o-ring grooves or on installation tools that could damage a new seal. 3. Remove pump and inspect bottom of hopper. Repair or replace hopper as necessary.

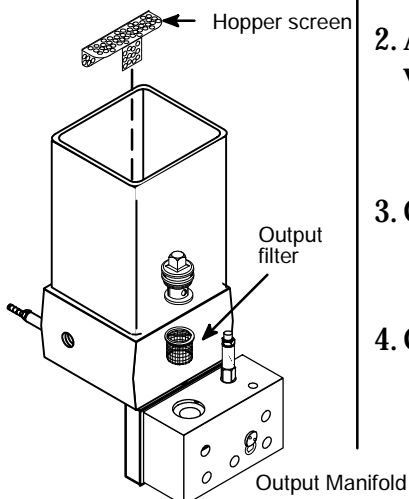
Gear Pump Troubleshooting Guide

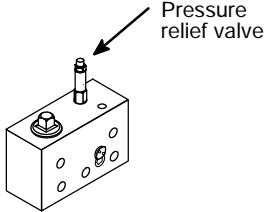
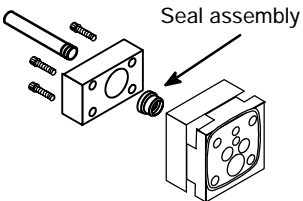
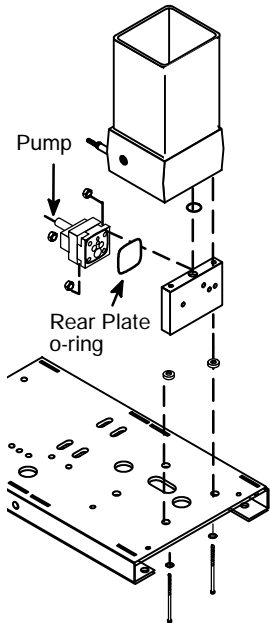


WARNING HOT SURFACE & ADHESIVE

Some of the procedures in the following Troubleshooting Guide require working near hot adhesive. Be sure to wear protective gloves, safety glasses and clothing and use proper tools for handling hot melt components.

Problem	Possible Cause	Solution
Pump doesn't operate.	<ol style="list-style-type: none"> 1. Motor on/off is off at the controller keypad. 2. Hopper temperature is below setpoint window. 3. No incoming electrical power. 4. System is not ready. 	<ol style="list-style-type: none"> 1. Check keypad switch. 2. Pump cannot operate until hopper has reached ready condition. Verify that hopper has reached ready. Re-program hopper operating setpoint and tolerance (hi/low) if necessary. 3. Check to see if ASU temperature control is operating. If not, check for presence of incoming supply voltage. 4. Wait until temperature scale (F/C) light is steady ON (not flashing).
Pump runs but there is no adhesive output.	<ol style="list-style-type: none"> 1. ASU is out of adhesive. 2. If pump has been serviced and motor leads reversed, pump will run with no output. 	<ol style="list-style-type: none"> 1. Add adhesive to hopper. 2. Check motor wiring to schematic.
Low or inconsistent adhesive output.	<ol style="list-style-type: none"> 1. Filter(s) clogged. 2. Adhesive used is too viscous. 3. Clogged hose. 4. Clogged applicators. 	<ol style="list-style-type: none"> 1. Remove and inspect filter basket and hopper screen. 2. Verify that system components are at appropriate temperatures and that the selected adhesive is correct for the application. 3. Inspect hose for kinks or internal plugs of debris or char. Clean or replace hoses as necessary. 4. Inspect applicators for plugged nozzles or filters. Clean or repair applicators as necessary.



Problem	Possible Cause	Solution
 <p>Pressure relief valve</p> <p>Adhesive leak at pump shaft seal.</p>  <p>Seal assembly</p>	<p>5. The adjustable pressure relief valve is opening.</p> <p>1. Pump seal is incorrectly positioned inside the seal and bearing assembly.</p> <p>2. Pump seal inoperative.</p>	<p>5. When fully closed (clockwise) and all applicators are off, adhesive pressure should be around 68 bar (1000 psi). If it is significantly less, the pressure relief valve should be replaced.</p> <p>1. Remove seal and bearing from pump. Verify that all components are correctly positioned.</p> <p>2. Remove seal from pump, inspect it and replace it if worn or damaged. Be sure there are no burrs or other sharp edges on pump shaft or on installation tools that could damage a new seal.</p>
<p>Adhesive leak at pump-to-hopper interface.</p>  <p>Pump</p> <p>Rear Plate o-ring</p>	<p>1. O-ring in pump's rear plate is inoperative.</p> <p>2. Pump assembly screws are missing or loose.</p> <p>3. Helicoil insert pulled out of hopper or pump interface plate.</p>	<p>1. Remove seal from pump, inspect it and replace it if worn or damaged. Be sure there are no burrs or other sharp edges in the o-ring groove or on installation tools that could damage a new seal.</p> <p>2. Verify that all four pump screws are tightly assembled to the pump mounting block.</p> <p>3. Remove pump and inspect bottom of hopper. Repair or replace hopper or pump mounting block as necessary.</p>

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Adhesive Application Systems

Chapter 8 DISASSEMBLY & RE-ASSEMBLY PROCEDURES

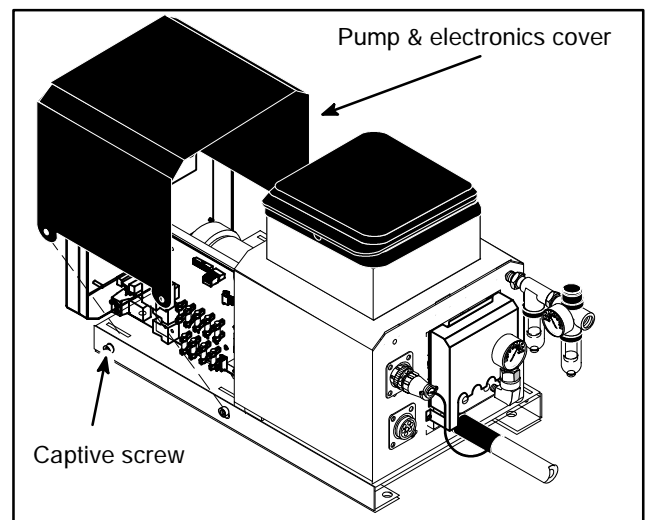
Disassembly Procedures

Note: Re-read Chapter 1 "Safety Precautions" before performing any disassembly procedures. All disassembly procedures must be performed by qualified, trained technicians.

When needed, cross-reference the exploded-view component drawings in Chapter 10 with each procedure in addition to the instructions and illustrations given in this chapter. Read the "Cautions" on page 8-7 before re-assembling the ASU.

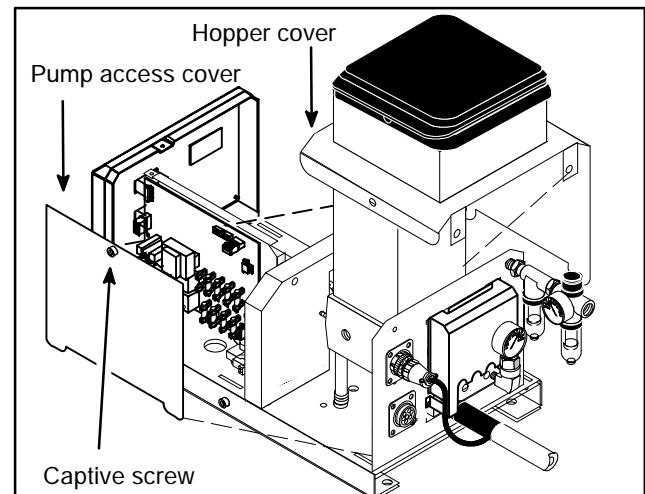
To Remove the Pump & Electronics Cover
(See illustration on page 10-7)

1. Loosen the four captive screws (two on each side) along the bottom of the pump and electronics cover.
2. Lift the cover straight up and out of its slots in the base.



To Remove the Hopper Cover
(See illustration on page 10-7)

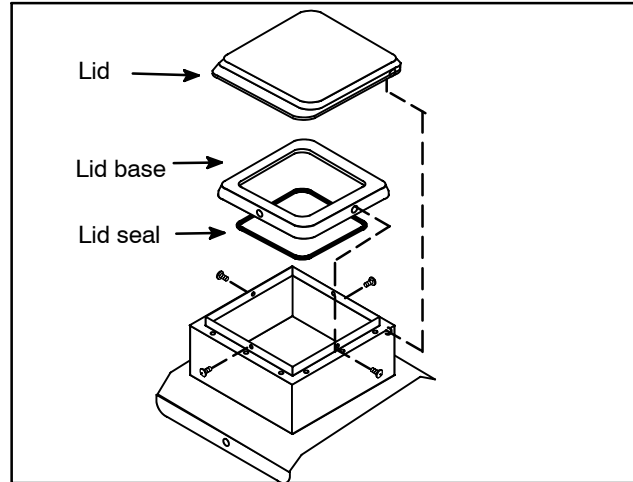
1. Loosen the two captive screws along the bottom of the hopper cover.
2. Remove the access cover screw, then lift the access cover out of its slots in the base.
3. Remove the screw that attaches to the heat shield.
4. Remove the two screws that attach the back panel to the hopper cover.
5. Lift the hopper cover up and out of its slots in the base.



To Remove the Hopper Lid

(See illustration on page 10-7)

1. Remove the four flat head screws which are located one on each side of the lid base.
2. Pull the lid up to remove.
 - a. **Lid Seal Replacement:** The lid seal (o-ring) is located inside the lid base.
 1. Remove the old seal, which rests against the top of the hopper.
 2. Install the new seal into the groove provided.



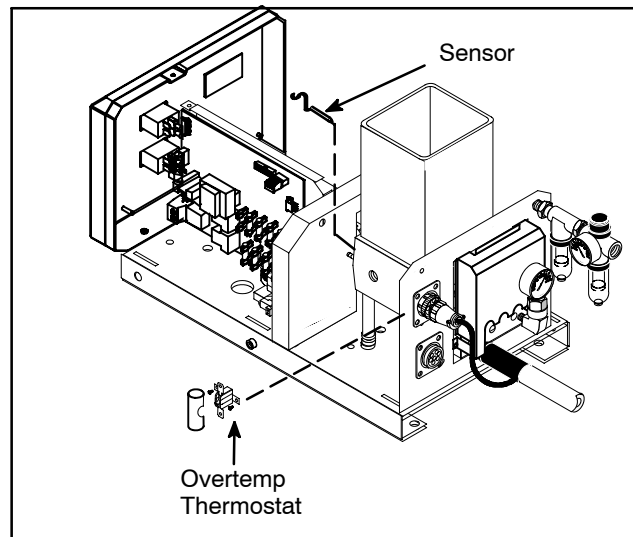
Thermostat Replacement

(See illustration on pages 10-7.)

1. Remove the access cover screw.
2. Lift the access cover out of its slots in the base.

Overtemp Thermostat Replacement:

1. Remove the two screws and slip the terminals and the hopper ground wire off of the thermostat.
2. Remove the thermostat from the base of the hopper.
3. Install new thermostat with two screws and re-install the terminals and hopper ground wire.



RTD Sensor Replacement

(See illustration on page 10-11)

1. Remove the pump and electronics cover. The RTD sensor is centered between the cast-in heaters on the base of the hopper.
2. Slip the sensor out of its adapter.
3. Unplug the sensor wires from pins 1 and 2 at X4 on the Control PCB (see PCB illustration on page 7-2).

To Access the Electrical Components (See also illustrations on pages 10-3 & 8-2)

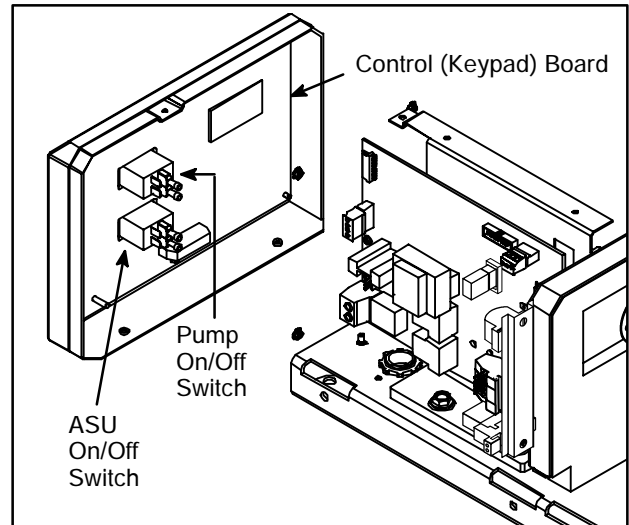
Remove the pump and electronics cover.

a. Main On/ Off Switch Replacement:

Note: there are two main switches (pump and ASU).

Switches are located on the display panel.

1. From the back of the switch, free it by squeezing it from either side.
2. Remove the switch through the back of the panel.
3. Disconnect four color-coded plug-in leads from the old switch and connect them to new switch.



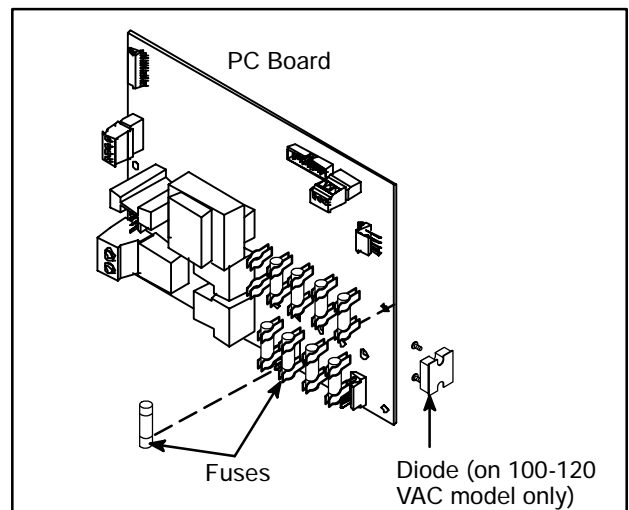
b. Fuse Replacement:

Note: Use fuses as specified on page 7-2.

i. Fuses on PC Board: (see also detailed illustration on page 7-2 sizes and locations of fuses). *Note on PCB fuses: each temperature zone is fused with two fuses, either one of which can blow causing the zone to not heat.*

c. Diode Replacement: The diode slides onto a screw on the panel divider. Tighten down the two screws.

Note: only the 100-120VAC ASU has a diode.



d. Control (Keypad) Board Replacement:

1. Disconnect electrical connections to the printed circuit board and main switch.
2. Remove the four screws in the control board's corners to remove the board.

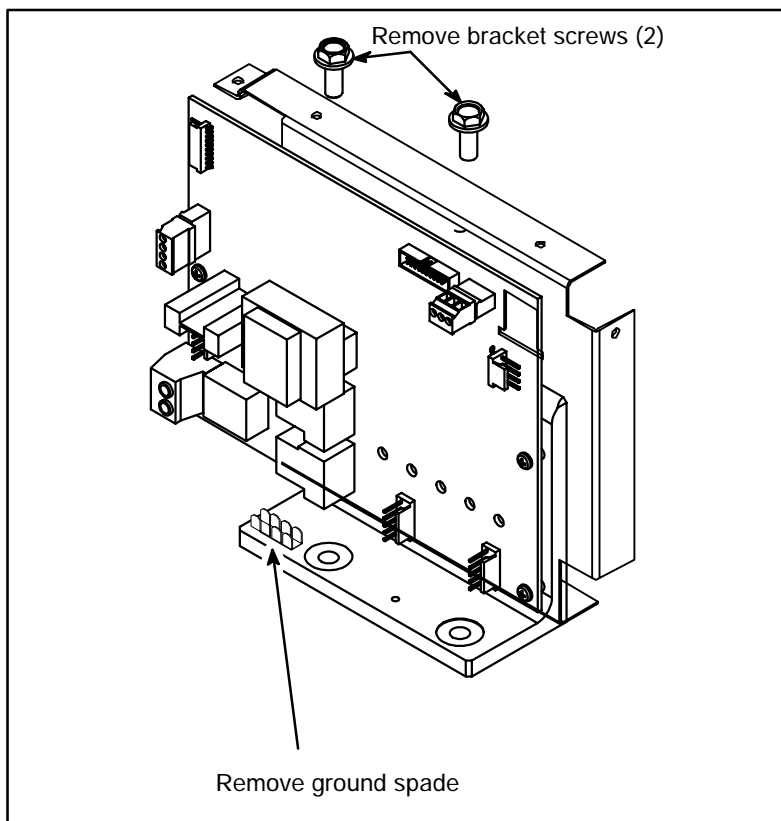
d. Printed Circuit Board Replacement:

Reference the manual section entitled “Handling Printed Circuit Boards” on page 7-1 before proceeding.

1. Disconnect the ground spade on the pcb's mounting bracket.
2. Disconnect all electrical connections to the board.
3. Remove the two mounting bracket screws.
4. Lift the old pcb and mounting bracket from the ASU.

Note: Do not attempt to separate the pcb from its mounting bracket. It is all one assembly.

5. Place the new pcb and mounting bracket in the ASU.
6. Re-install the two mounting bracket screws.
7. Re-install the ground spade on mounting bracket.
8. Re-install electrical connectors onto the board (refer to pg. 7-2, if necessary).



PUMP DISASSEMBLY WARNINGS



HOT SURFACE

If the pump is not operable but the heating system will function, raise the temperature of the application system to the operating temperature to aid in the pump disassembly process. Otherwise, a controlled heating method is recommended to melt hardened hot melt adhesive. Never use a torch or an open flame on any of the components of the application system.



HIGH VOLTAGE

Once the system is up to temperature, disconnect and lockout all incoming power before proceeding.



HIGH PRESSURE

BEFORE PERFORMING ANY PUMP REPAIR, YOU MUST PURGE ALL ADHESIVE AND PRESSURE FROM THE DYNAMINI SYSTEM. Position a heat-resistant container under the filter manifold's purge drain. Carefully loosen the purge screw located in the port of the outlet filter manifold and allow adhesive and pressure to escape. See page 6-2 for detailed instructions.

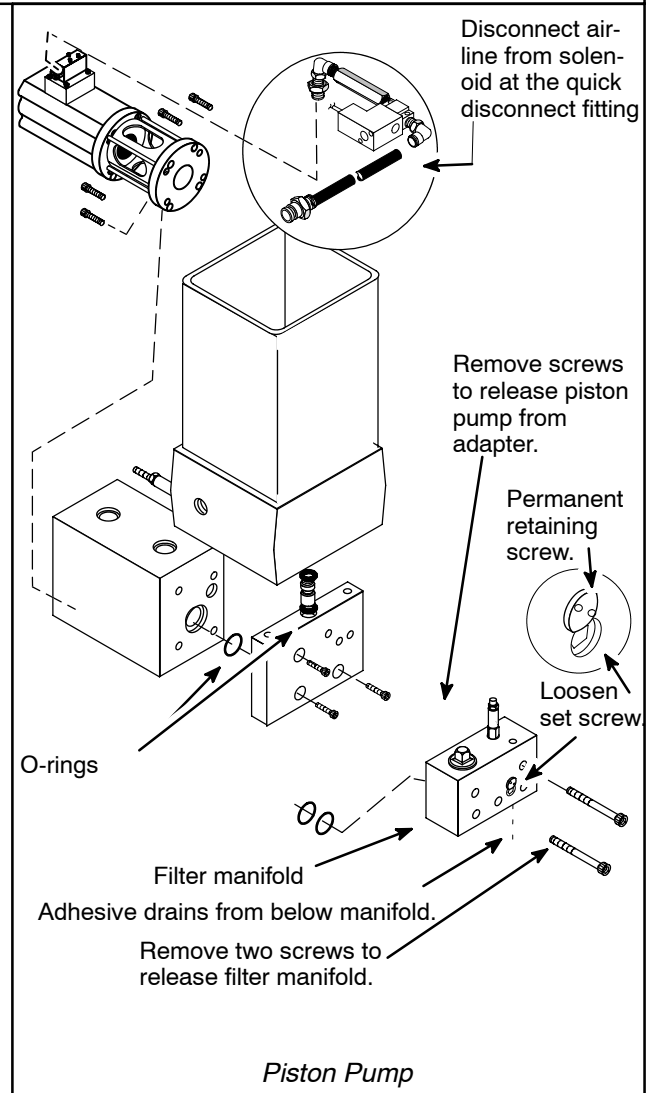
To Access the Pump or Motor

(See illustrations on page 10-9 or 8-1)

Remove the pump and electronics cover.

a. Piston Pump Removal:

1. Turn OFF air pressure, then disconnect the air line from the solenoid valve mounted on the top of the airmotor.
2. Disconnect the two wires that run from the solenoid to the circuit board.
3. Loosen set screw to drain excess glue from filter manifold.
4. Remove the two socket head cap screws that connect the filter manifold to the pump adapter.
5. Remove the three screws that hold the pump to the pump adapter.
6. Remove the pump/ airmotor assembly from the end of the unit.
7. *To re-assemble:* Replace three o-rings between pump & pump adapter and filter manifold and pump adapter. Tighten the three pump adapter screws to the pump. Torque should be approximately 22.6 Nm (16.7 ft/lb) at room temperature. With pump and hopper at 177°C (350°F), the maximum allowable torque on pump assembly screws is 18.8 Nm (13.9 ft/lb). A Piston Pump Rebuild Kit is available.



b. Gear Pump and Motor Removal:

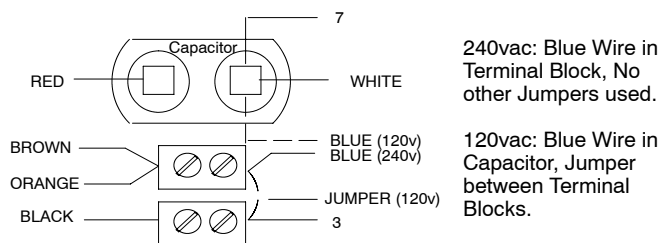
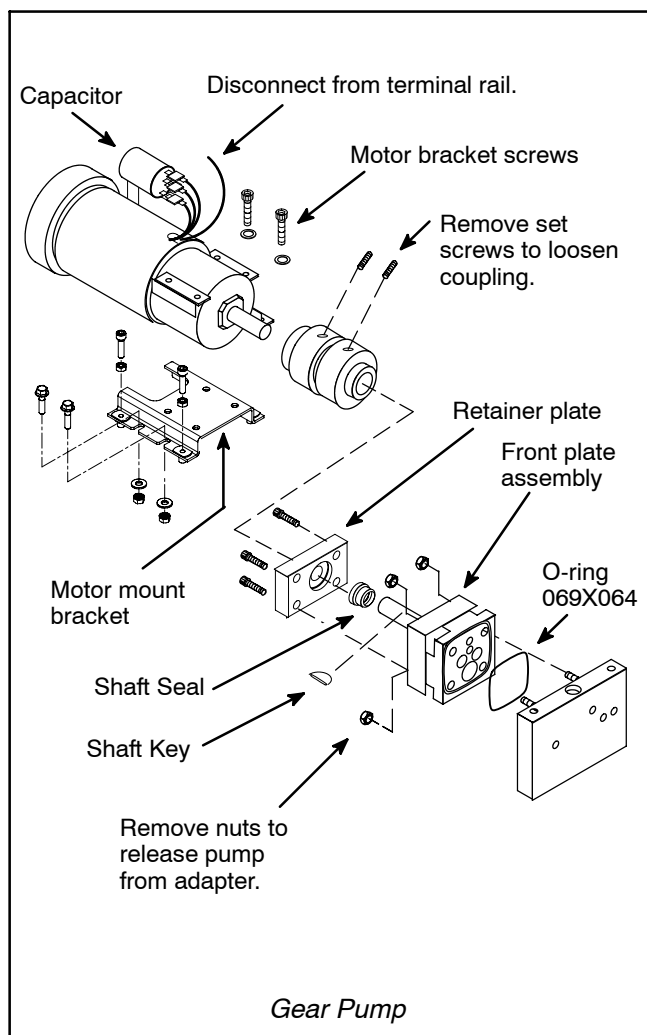
1. Disconnect the motor's electrical cable from the ASU by unplugging it at the circuit board
2. Remove the bolts and lockwashers which connect the motor to the base of the unit.
3. Remove the two set screws located in the coupling.
4. Loosen the coupling and lift out the motor.
5. To replace the gear pump, remove the four nuts and lockwashers that hold the pump to the pump adapter block.
6. Disconnect the coupling.
7. Remove the pump assembly from the end of the unit.
8. For re-assembly: slide new pump onto the four studs. Tighten the four nuts to secure the pump. Torque should be approximately 40.7 Nm (30 ft/lb) at room temperature. With pump and hopper at 177°C (350°F), the maximum allowable torque on these nuts is 33.9 Nm (25 ft/lb).

c. Gear Pump Seal (O-ring) Replacement:

1. Remove the pump from the ASU (see instructions above, "a" or "b").
2. Remove the external pump seal (PN 069X064) from its groove on the back of the pump adapter plate (this is the seal located between the adapter plate and the hopper). Reference the pump exploded-view illustration in Chapter 10 for your specific pump.
3. Install the new seal.

d. Gear Pump Shaft Seal Replacement:

Remove the shaft key and the four socket head cap screws holding the seal retainer plate. The seal (069X061) is located between the retainer plate and the front plate assembly.



Gear Motor Wiring Diagram

Note on the Cast-in Heaters

(See illustration on page 10-11)

The cast-in heaters installed in the base of the hopper are not replaceable and will last the life of the ASU.

Re-Assembly Procedures

Unless noted, the ASU's re-assembly is simply the reverse sequence of the disassembly procedures. However, the following "cautions" should be followed (whenever they apply) for proper re-assembly:



CAUTION: In general, all **O-RINGS AND SEALS** must be replaced whenever hot-melt equipment is re-assembled. All new o-rings must be lubricated with o-ring lube (PN N07588).

CAUTION: **TAPERED PIPE THREADS** are found on air line fittings used with the pump air supply and on the outlet filter manifold. Apply thread sealant (PN N02892) whenever tapered pipe threaded parts are re-assembled.

CAUTION: **SOME FITTINGS** used for adhesive on the ASU have straight threads and o-ring seals. Use of thread sealant is not necessary with these parts, but the o-ring seals should be clean and lubricated. Tighten straight-threaded parts and fittings until their shoulders are firmly seated. Excessive torque may damage straight-threaded parts and the use of power wrenches is not recommended.

CAUTION: **HOT-MELT RESIDUE** must be cleaned from parts before they are re-assembled, particularly from threaded parts. As a precaution against adhesive residue preventing proper re-assembly, threaded parts must be re-tightened at operating temperature.

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Adhesive Application Systems

Chapter 9

AVAILABLE OPTIONS & ACCESSORIES

Pressure Gauge Kit: PN 101175

An optional analog pressure gauge can be mounted on the outlet filter manifold. Reading the adhesive pressure at the manifold, rather than in-line on a hose, allows for more precise monitoring of system pressure. It is also useful for troubleshooting and maintenance.

The gauge is installed at one of the adhesive ports on the manifold (see illustration on page 3-5). There is no “dedicated” port for the gauge, any one of the three ports on the manifold may be used. Fittings are included in the kit.

Filter Option:

40 Mesh Outlet Filter: PN 101246

Some situations do not call for a fine mesh outlet filter. A “clean” adhesive or one with a long pot life are examples. Systems utilizing lower temperatures or systems running in a clean environment can also utilize a 40 mesh filter. Standard equipment on Dynamini is a 100 mesh filter (PN 101247).

Pump Options and Accessories:

12:1 Piston Pump: PN 105072 (120v) or 105073 (240v)

The ASU is available with a constant-pressure, air-operated piston pump. It provides smooth output pressure and insures a high pressure adhesive output from a low pressure, compressed air input. A piston pump is superior for intermittent applications which require no volumetric control.

Piston Pump Repair Kit: PN 105328

The Piston Pump Repair Kit contains the following items needed to rebuild the 12:1 piston pump:

PN	Description	Qty.	PN	Description	Qty.
L16569	Bearing & Shaft Seal Kit	1	N00183	O-ring, 016	1
108772	O-ring, Adapter Plate	1	N01614	O-ring, 910	1
108700	Lube, Seal, 1/4 oz.	1	N00190	O-ring, 024	1
N01703	Fitting	3	N01702	O-ring, 904	3
N01618	Fitting	1	N00187	O-ring, 020	1
N07121	Ring, Seal, 111	1	069X270	O-ring, 025	1

Piston Pump Rebuild Kit: PN 109969

This kit contains a PN 105328 Pump Repair Kit, a PN 109968 Pump & Airmotor Seals Kit, a L16534 Pump Shaft, a L21189 Inlet Check Valve Assembly and a L21188 Outlet Check Valve Assembly.

Piston Pump Bearing and Shaft Seal Kit: PN L16569

This kit contains all items needed to replace the piston pump’s shaft seal and bearing, including seals, o-ring, pump shaft bearing and retaining ring. A seal pedestal and o-ring lubricant are also included.

Gear Pumps

For higher tolerances and precision, a choice of gear pumps is available for the Dynamini. Gear pumps give better service for continuous applications or applications which require more control over the volume of adhesive pumped. Gear pumps available are:

- PN 109908: 0.55cc/rev single, standard accuracy, cast iron Gear Pump
- PN 100860: 1.54 cc/rev single, standard accuracy Gear Pump
- PN 100861: 3.2 cc/rev single, standard accuracy Gear Pump
- PN 100862: 4.5 cc/rev single, standard accuracy Gear Pump
- PN 109690: 10 cc/rev single, standard accuracy Gear Pump

Gear Pump Repair Kit: PN 103151

Contains the following items needed to repair the PN 100860, 100861 and 100862, and the 109908 gear pumps:

PN	Description	Qty.	PN	Description	Qty.
N00198	O-ring	2	069X064	O-ring	3
018X031	Ball Bearing	5	078F017	Ring, Clip	4
069X061	Pump Shaft Seal	1	078I001	Key, Woodruff	1

Capacitor Kit: PN 106063

Consists of the following items for the 1/4 HP motor (PN 103020): capacitor, clamp, boot, screw, installation instructions and wiring diagram.

Motor Seal & Gasket Kit: PN 106370

Consists of the following items for the 1/4 HP motor (PN 103020): output seal, input seal and gasket.

Troubleshooting Job Aide

A set of six 8.5" x 5.5" illustrated, laminated cards (12 pages front and back) which attach to the ASU and are used for troubleshooting the Dynamini.

Stand Assembly: PN 111243

This static Stand Assembly comes pre-drilled with front and back mounting plates for the installation of customer-selected auxiliary controls. Designed with square holes for carriage bolts that allow for one-wrench assembly. Assembly instructions enclosed.

Swirl Kits

A swirl kit is needed for the addition of one or two handheld applicator(s) to the system.

- PN 111892: Dynamini Swirl Kit, Single 120V
- PN 111893: Dynamini Swirl Kit, Dual 120V
- PN 111894: Dynamini Swirl Kit, Single 240V
- PN 111895: Dynamini Swirl Kit, Dual 240V

Recommended Service Parts List

Category	Part No.	Description	Qty.
Electrical:	111668	Printed Circuit Board w. heat sink	1
	108566	Fuse, 6.3 A/ Super Fst 5x20 (on pc board)	10
	102762	Fuse, 1 amp, 5x20, fast	5
	102763	Fuse, 5 amp, 5x20 (on pc board)	5
	105279	RTD Sensor, PT 100	1
	104166	Over-Temperature Thermostat	1
	105032	Diode (120VAC model only)	1
Filters:	101246	Filter Basket, 40 mesh/ 420 micron (optional)	2
	101247	Filter Basket, 100 mesh/ 149 micron	2
	103041	Hopper Filter	1
Misc:	069X058	O-ring 028 (filter plug)	1
	N00181	O-ring 014 (outlet filter manifold)	3
	N00188	O-ring 022	1
	N00191	O-ring 027	1
	069X270	O-ring 024	1
	N00196	O-ring 111 (for optional pressure gauge)	1
	L15653	Kit, Flushing Fluid, 1 gallon	1
	N07588	O-ring Lubricant	2
	114852	Hopper Collar Gasket	1
Kits:	L16569	Piston Pump Bearing & Shaft Seal Kit	1
	105328	Piston Pump Repair Kit	1
	109969	Piston Pump Rebuild Kit	1
	103151	Gear Pump Repair Kit	1
	109982	Pressure Relief Valve Repair Kit	1
	106063	Capacitor Kit (motor)	1

ITW Dynatec
An Illinois Tool Works Company



Adhesive Application Systems

Chapter 10 COMPONENT ILLUSTRATIONS & BILLS OF MATERIAL



WARNING

All parts must be periodically inspected and replaced if worn or broken. Failure to do this can affect equipment's operation and can result in personal injury.

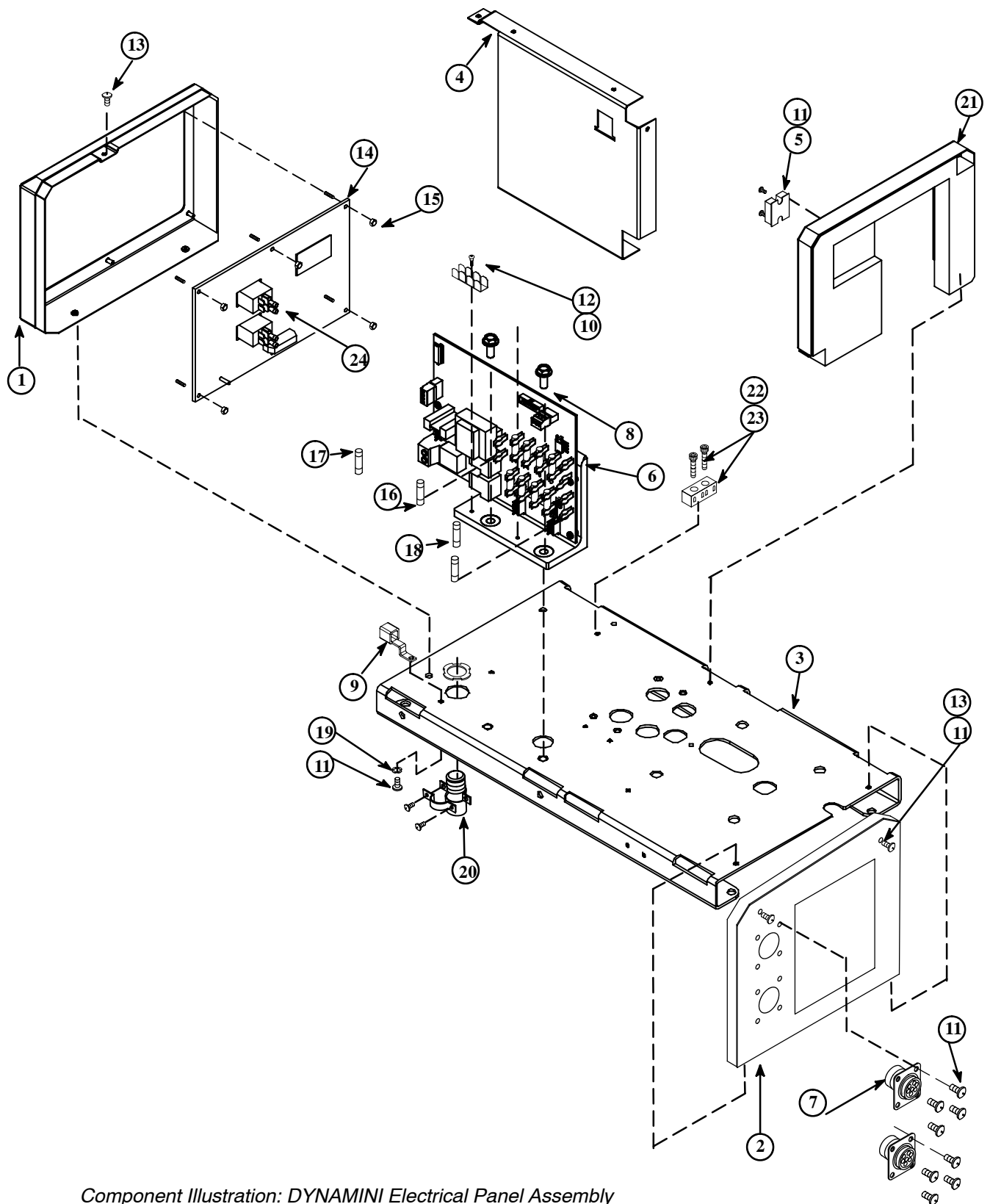
Chapter Format

This chapter contains the component illustrations (exploded-view drawings) for each assembly of the DYNAMINI ASU. These drawings are useful for finding part numbers as well as for use when maintaining or repairing the unit.

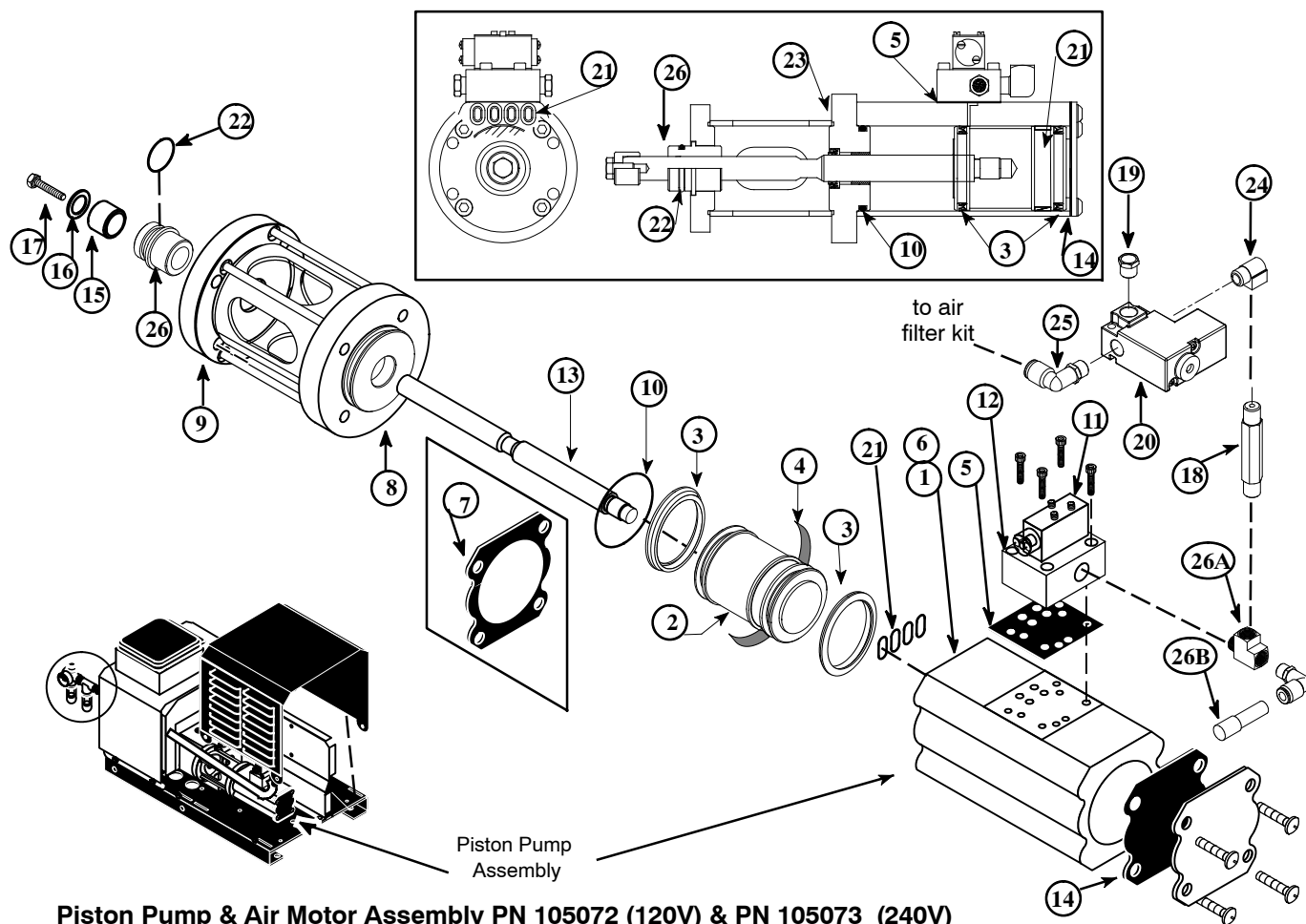
Note: most common nuts, bolts and fasteners can be obtained locally at your hardware store. Specialty fasteners are available by contacting Dynatec's Customer Service.

Bill of Materials for DYNAMINI Electrical Panel Assembly

<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	102241	Front Cover End (part of 111669 Front Panel Assy.)	1
2	102240	Back Cover End	1
3	102239	Base, DYNAMINI	1
4	102246	Panel Divider	1
5	105032	Diode (120V models only)	1
6	111668	Printed Circuit Board/ Heat Sink Assembly	1
7	111660	Receptacle And Wiring Harness (240V)	2
	111678	Receptacle And Wiring Harness (120V)	2
8	108297	M8-10 x 20mm Hex Flange Screw	2
9	105562	Ground Lug	2
10	108745	Screw Ground Spade	2
11	105113	M4 X 8mm SHC Screw	18
12	111677	Ground Spade Assy.	1
13	106157	Lock Washer, Int. Tooth	10
14	111363	Control Panel (of 111669 Front Panel Assy.)	1
15	107391	Hex Nut	7
16	108566	Fuse, PCB, 6.3 amp	10
17	102762	Fuse 1 amp Fast	1
18	102763	Fuse, 5 amp, 5 x 20, Slow	2
19	105164	Washer, #8	2
20	105199	Straight Conduit Fitting	1
21	102245	Heat Shield	1\1
22	112676	Terminal Block	1
23	103537	M3 x 16mm SHC Screw	2
24	110747	Switch, Rocker, DPDT, Sealed	2



Component Illustration: DYNAMINI Electrical Panel Assembly

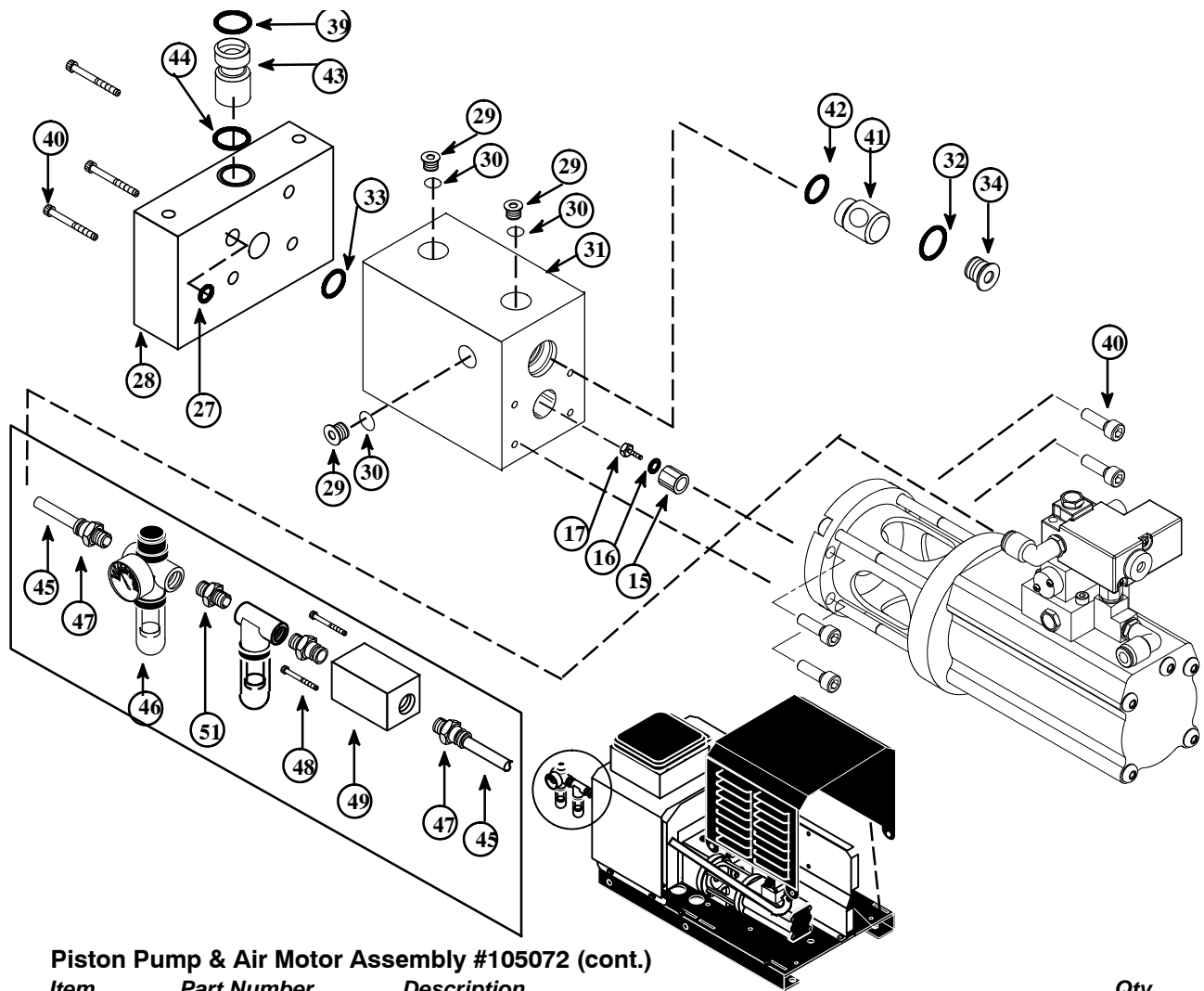


Piston Pump & Air Motor Assembly PN 105072 (120V) & PN 105073 (240V)

Item	Part Number	Description	Qty
1	109970	Air Motor Assembly (replaces PN 105070)	1
2	NPN	2" Pump Piston	1
3*	NPN	2" Piston Seal 60030-4238	1
4*	NPN	2" Wear Strip 60624	1
5*	108379	Valve Gasket	1
6	NPN	2" Stroke Pump Tube	1
7*	NPN	Pump Gasket A01046-02 (old-style pump only)	1
8	NPN	Mounting Flange A01046-11	1
9	105726	Mounting Flange with Float Seal	1
10	NPN	O-ring, -224	1
11	104437	Valve	1
12	106931	Valve Manifold	1
13	109953	Pump Shaft (<i>Pump Shaft Old, 105070 Assembly</i>)	1
14*	NPN	Gasket Air Motor Cap	1
15	L16534	Piston, Pump Shaft	1
16*	N06918	Belleville Washer, 1/4	1
17*	N01739	1/4-20 x .50 HHC Screw	1
18	110213	Solenoid Nipple	1
19	030B108	Breathing Vent	1
20	104479	Solenoid, 120v (included in PN 105072)	1
	104101	Solenoid, 240v (included in PN 105073)	1
21		O-ring, -011	4
22	N06913	O-ring, -118	1
23	NPN*	Seal, Rod Wiper .625 Viton	1
24	072X098	Street Elbow, 1/8 NPT	1
25	N06436	Elbow, 1/4 tube, Push-in x 1/8	1
26*	L16569	Seal And Bearing Assembly	1
26A	115497	1/8 NPT Street Tee	1
26B	N06506	Airline Plug (used only on ASUs equipped with mechanical pressure relief valve)	1

Note:*These items are included in Piston Pump Rebuild Kit 109969 (replaces 105330**)

cont.

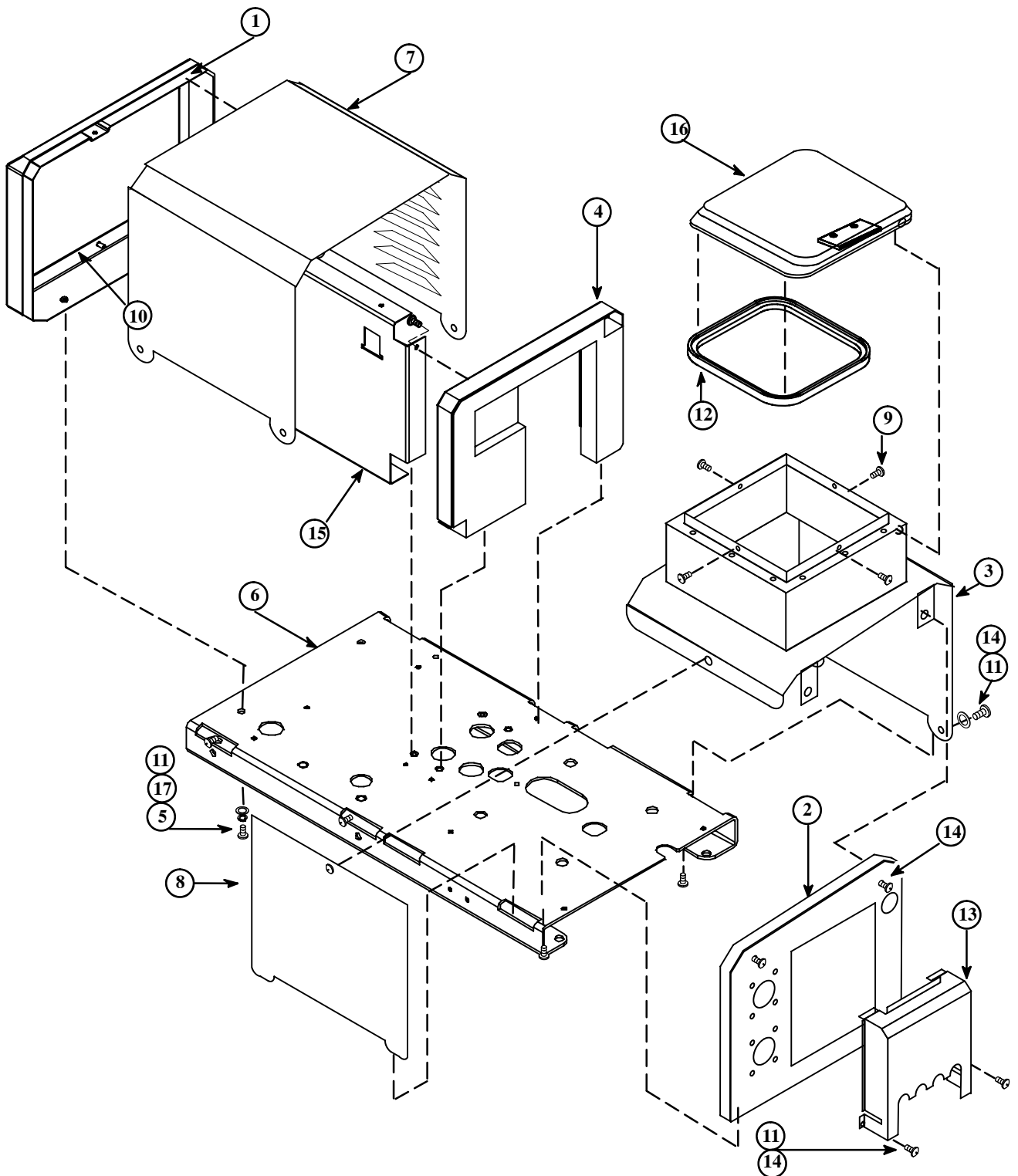


Piston Pump & Air Motor Assembly #105072 (cont.)

Item	Part Number	Description	Qty.
	109970	Air Motor Assembly	1
27 *	N00183	O-ring, -016	1
28	102243	Piston Pump Mounting Block	1
29 *	N01703	Plug Fitting	3
30 *	N01702	O-ring, -904	3
31	100344	Piston Pump Body	1
32 *	N01614	O-ring, -910	1
33 *	N00190	O-ring, #-024	1
34 *	N01618	Plug Fitting	1
35 *	L16543	Pump Shaft	1
36	L16534	Piston, Pump Shaft	1
37	N06918	Bellevue Washer, 1/4	1
38	N00723	1/4-20 x .50 HHC Screw	1
39 *	069X270	O-ring, -025	1
40	101156	M6 x 20 SHC Screw (Note: torque to 90 in/lbs (10nm))	8
41 *	L21188	Outlet Check Valve, Service Assembly (available as an assembly only)	1
42	N07121	O-ring, -111	1
43 *	L21189	Inlet Check Valve Assembly (available as an assembly only)	1
44	N00187	O-ring, -020	1
		Fittings For Coalescing Air Filter	1
45	N07677	TFE Tubing, .250 Diameter	2.5'
46	100380	Filter Assembly	1
47	N06430	Brass Male Connect Fitting	1
48	105113	M4 x 8 SHC Screw	2
49	101888	Air Block	1
50	N01067	Brass Nipple	2
	Note:	*These items are included in Piston Pump Rebuild Kit 109969 (replaces 105330)	

Bill of Materials for DYNAMINI Cabinet Assembly

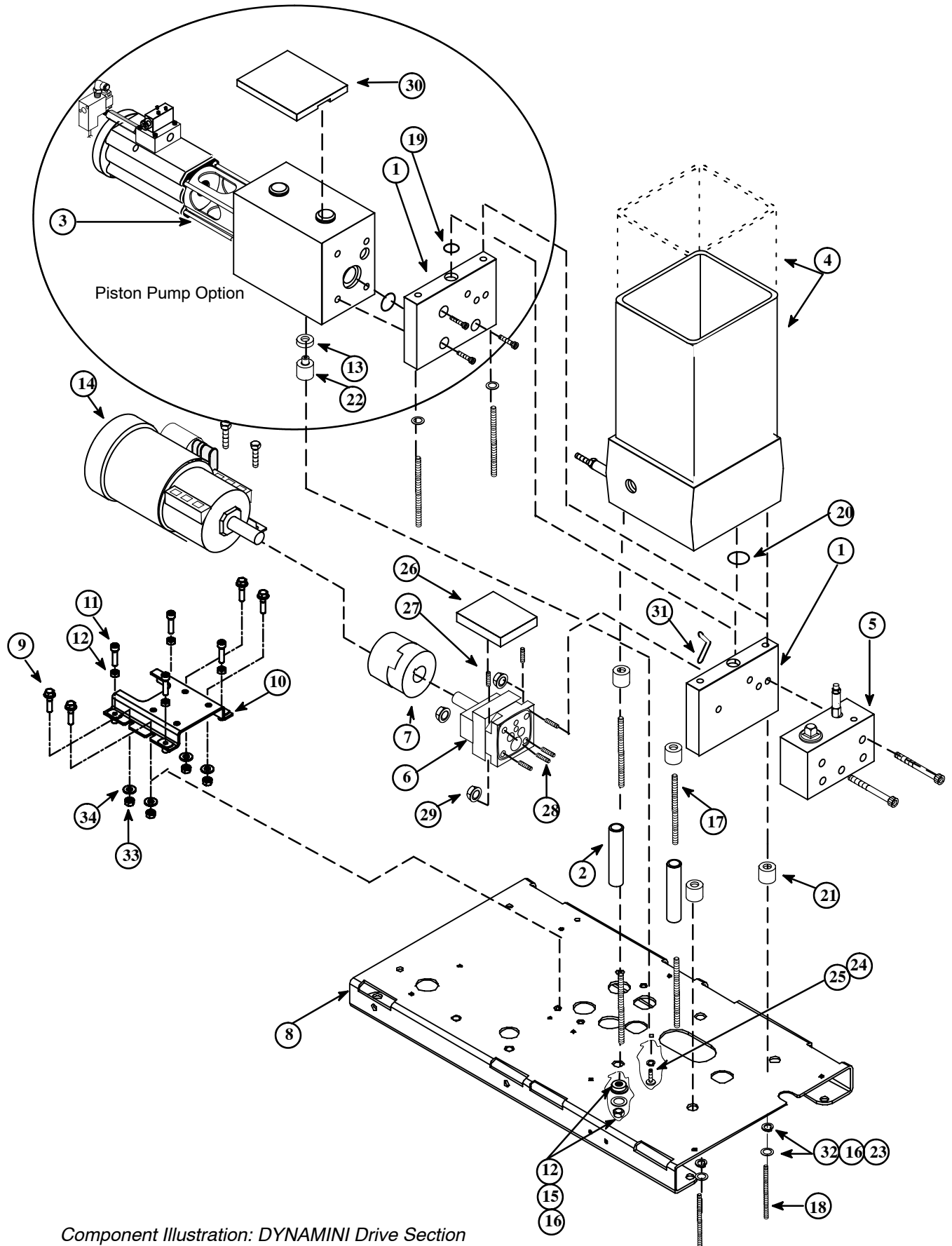
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	102241	Front Cover End	1
2	102240	Rear Cover End	1
3	102242	Hopper Cover (Model 05, 5 Kg / 11 lb)	1
	103242	Hopper Cover (Model 10, 10 Kg / 20 lb) (not shown)	1
4	102245	Heat Shield	1
5	105113	M4 x 8mm SHC Screw (keypad panel)	2
6	102239	Base, DYNAMINI	1
7	102247	Pump and Electrical Cover	1
8	102911	Access Cover	1
9	115051	M4 x 6mm Flat Head Screw	4
10	106157	Lock Washer, M4, Int. Tooth	2
11	105164	Washer, #8, Flat	10
12		Hopper Collar Gasket (included in Lid Assembly)	1
13	102614	Cover, Hose, Single Filter	1
14	105113	M4 x 8mm SHC Screw	6
15	102246	Panel Mount	1
16	103289	Lid Assembly (available as an assembly only)	1
17	106198	Lock Washer, M4.2, M7.6, .9, SS	2



Component Illustration: DYNAMINI Cabinet Assembly

Bill of Materials for DYNAMINI Drive Section

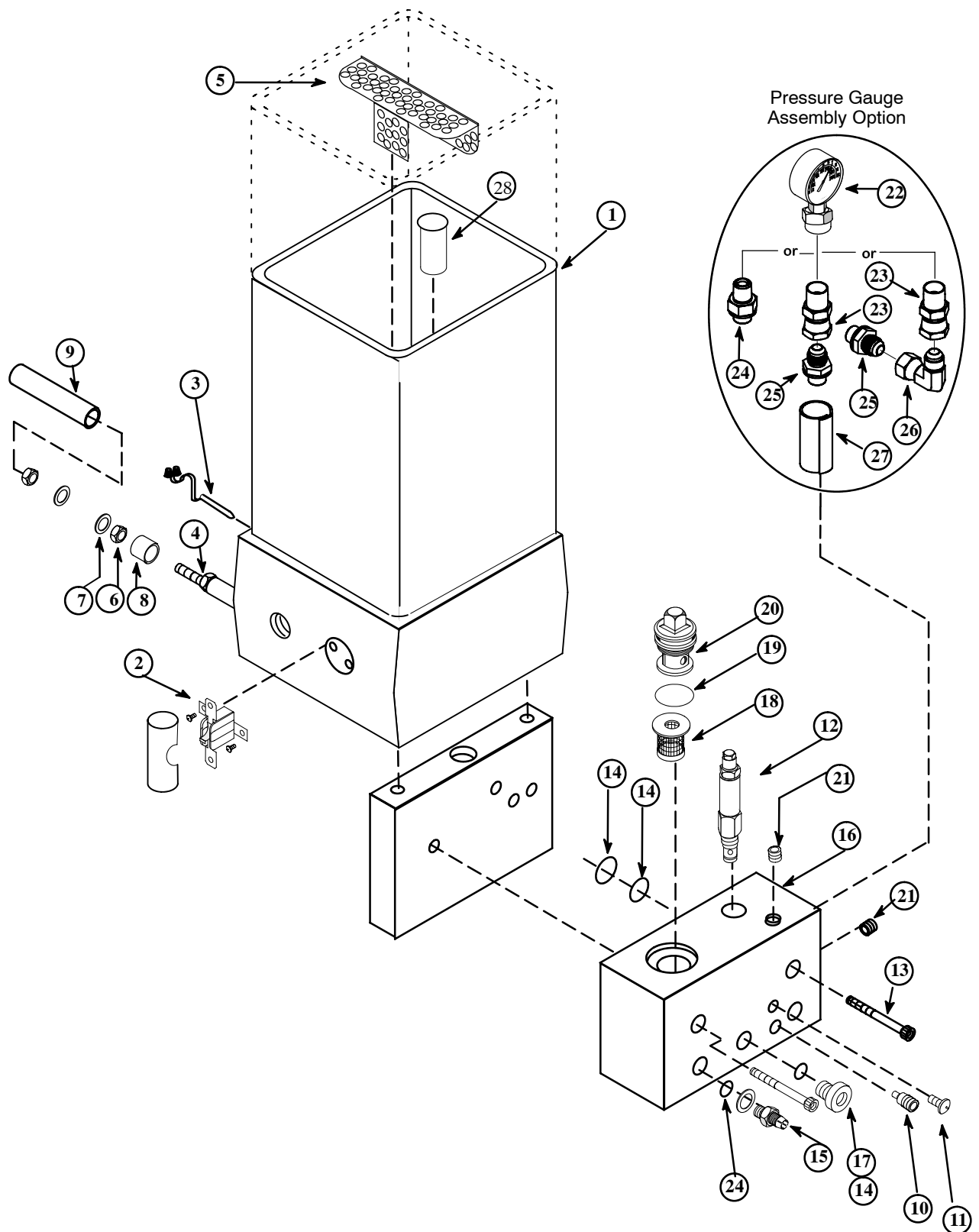
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	102244	Gear Pump Mounting Block	1
	102243	Piston Pump Mounting Block	1
2	102615	Spacer	2
3	105072	Piston Pump Assembly, 120v	1
	105073	Piston Pump Assembly, 240v	1
4	102591	Hopper, Model 05, 5 kg / 11 lb	1
	103241	Hopper, Model 10, 10 kg / 20 lb	1
5		Filter and Pressure Relief Section (reference melt section for details)	1
6		Pump (reference your order for specific part number)	1
7	102584	Coupling	1
8	102239	Base	1
9	109537	M6 x 16mm Screw, Hex Flange Head	4
	114969	Motor Bracket Assembly	1
10	114809	Motor Bracket	1
11	<i>locally available</i>	Screw, SHC, M6x1.0x25 SST (adjusting screw)	4
12	<i>locally available</i>	Nut, M6x1.0, Hex SST	4
13	L00006	Spacer (used w/ alum. block for piston pump)	1
14	103020	Motor, 1/4 HP, 115/230, 90rpm	1
15	L00475	Spacer	4
16	105126	M8 Lock Nut	4
17	105061	M8 x 50 Stud	4
18	104570	M8 x 150mm, Stud	2
19	069X270	O-ring, #-024	1
20	N00188	O-ring, #-022	1
21	105135	Ceramic Spacer	4
22	104530	Aluminum Spacer	1
23	100475	Washer, Insulating	4
24	106157	Lock Washer, M4, Int. Tooth	1
25	105113	Screw, SHC Screw, M4 x 8mm	1
26	105166	Heat Transfer Block	1
27	105167	M3 Set Screw	2
28	104073	M10 x 105 Stud	4
29	104158	M10 Flange Nut	4
30	102998	Heat Transfer Plate, Piston Pump (option)	1
31	N00191	O-ring, #-027	1
32	N00688	Flat Washer	4
33	<i>locally available</i>	Nut, M6x1.0, KEPS	4
34	<i>locally available</i>	Washer, 9/32 x 5/8 x 1/16, steel	4



Component Illustration: DYNAMINI Drive Section

Bill of Materials for DYNAMINI Filter And Melt Section

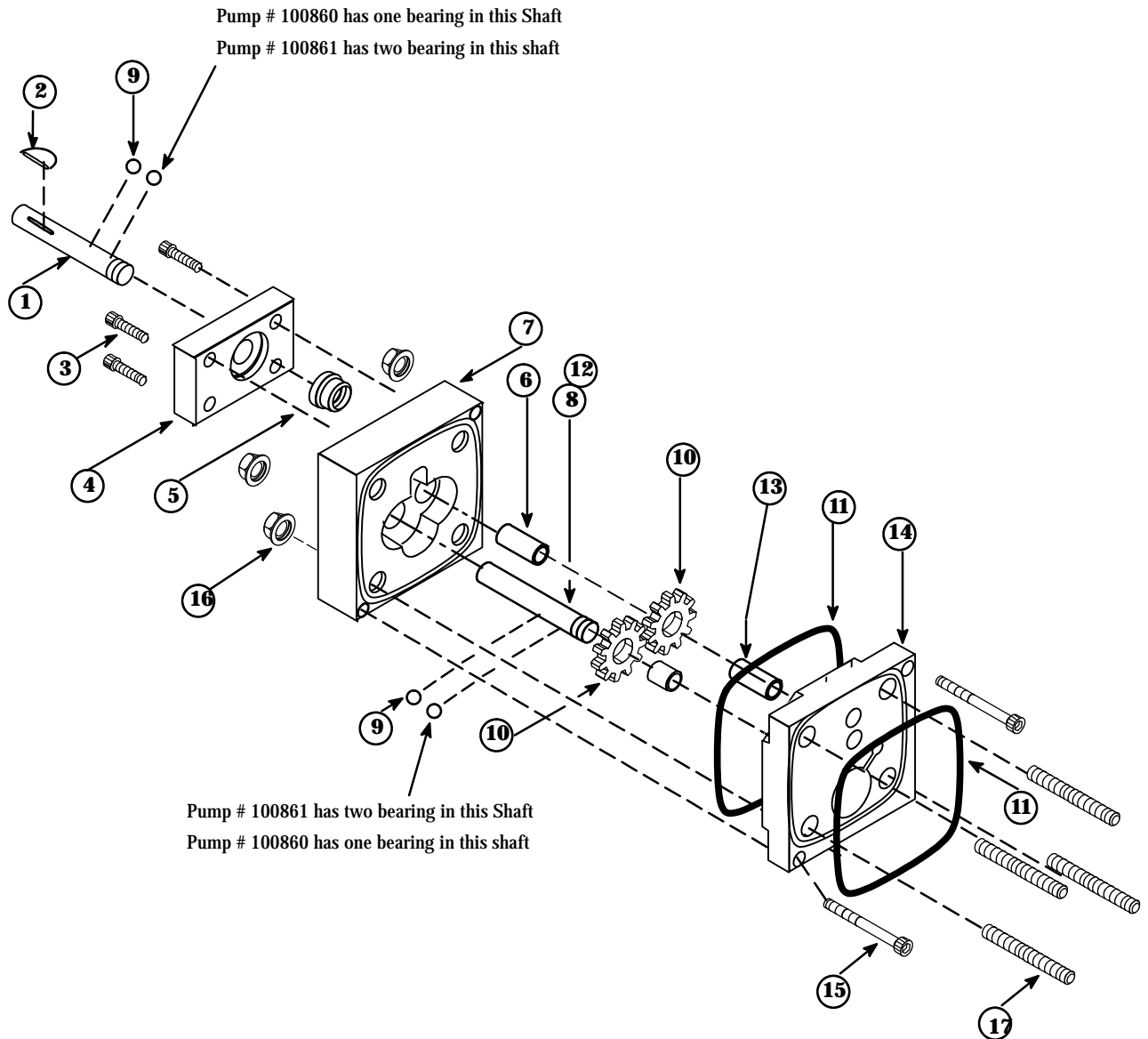
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	102591	Hopper (Model 05, 5 Kg/ 11 lb)	1
	103241	Hopper (Model 10, (10 Kg/ 20 lb)	1
2	104166	Mechanical Overtemp Thermostat Assembly	1
3	105279	Temperature Sensor, RTD, PT 100	1
4	not replaceable	Cast-In Heater	4
5	103041	Hopper Filter	1
6	No Part Number	Nut, M4	8
7	No Part Number	Washer, M4	8
8	No Part Number	Porcelain Spacer	4
9	102411	Cap,Hi Temp, .60 ID x 1.5L	2
	111670	Filter Manifold Assembly	1
10	104852	Drain Plug	1
11	101833	10-32 x 1/2 Tamper Proof Retaining Screw	1
12	101840	Pressure Relief Valve	1
13	105110	M8 x 55 SHC Screw	2
14	N00181	O-ring, -014	3
15	101624	BSP Hose Fitting x # 6 JIC	2
16	102236	Manifold Output Filter	1
17	101625	1/4-18 BSP Plug	1
18	101247	Filter Basket, 100 mesh/ 149 micron	1
	101246	Filter Basket, 40 mesh/ 420 micron (option)	1
19	069X058	O-ring, -028	1
20	006C024	Filter Nut	1
21	N00754	Flush Plug	3
	101175	Pressure Gauge Assembly (Option)	1
22	101174	Pressure Gauge (option)	1
23	104325	Fitting Adapter, #6 x 1/4 NPT (option)	1
24	103330	Fitting, Adapter, 1/4 BSPP x 1/4 NPT	1
25	101624	Fitting, Adapter, #6 JIC x 1/4 BSPP (includes N00196 O-ring)	1
26	N07830	Fitting, 90 deg., #6 JIC Male x #6 JIC Female	1
27	102987	Insulator Cuff	1
28	L07348	Weir, Hopper, N05/N10 (piston pump only)	1



Component Illustration: DYNAMINI Filter & Melt Section

Bill of Materials for 1.54 cc / Rev. , Single Gear Pump Assembly # 100860
Bill of Materials for 3.2 cc / Rev. , Single Gear Pump Assembly # 100861

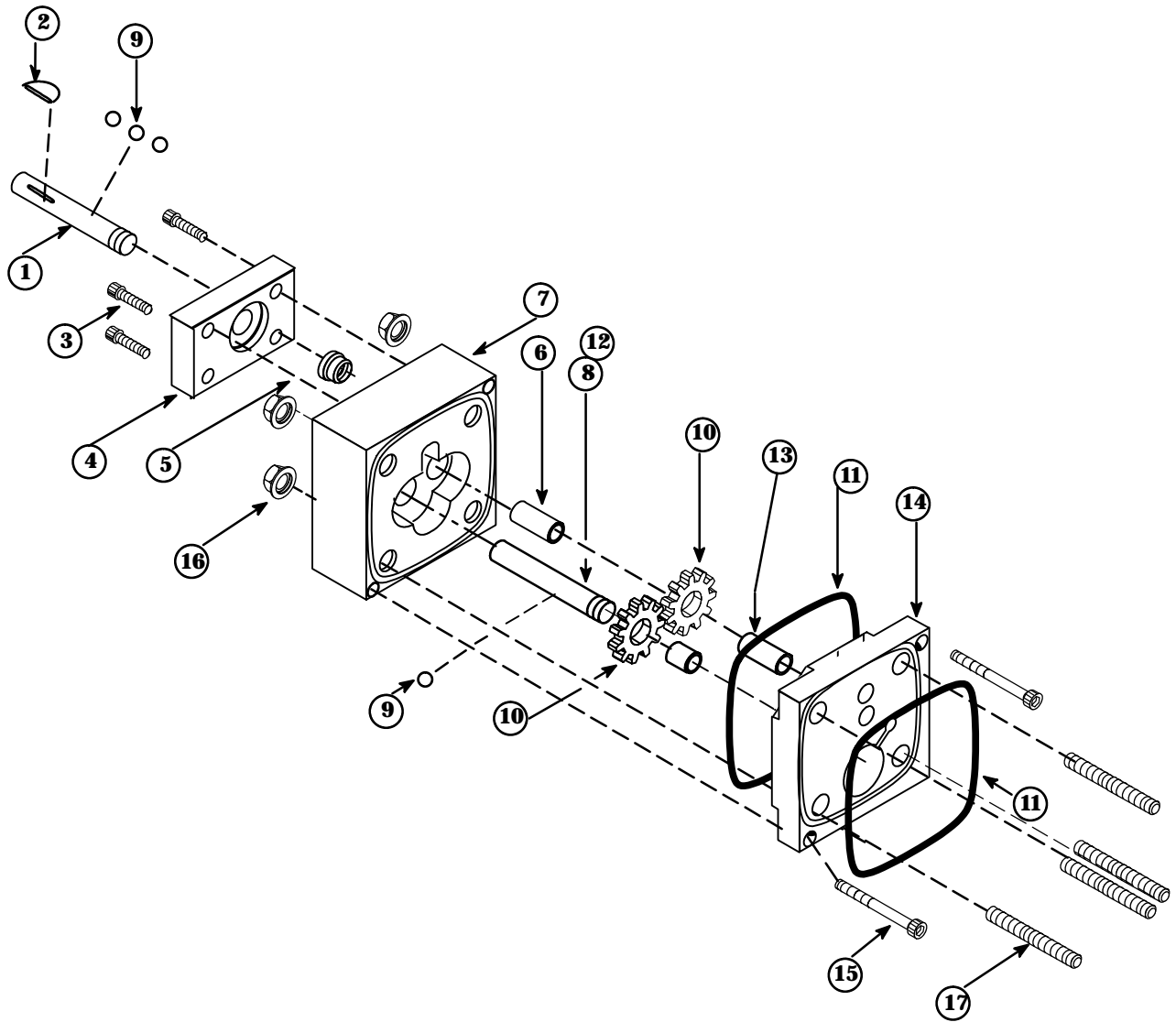
<i>Item No.</i>	<i>Part Number</i> #100860 / #100861	<i>Description</i>	<i>Qty.</i>
1	012D079 / 012D077	Drive Shaft	1
2	078I001	Key, Woodruff	1
3	101626	M5 x 12 SHC Screw	4
4	069X160	Seal Retainer & Bearing Housing	1
5	069X061	Lip Seal	1
6	018X041	Bearing Sleeve	2
7	100866 / 100867	Front Plate Assembly	1
8	012D080 / 012D078	Driven Gear Shaft	1
9	018X031	Ball, 1/8" Diameter (See illustration for quantity)	2-4
10	012C020 / 012C019	Drive Gear,	2
11	069X064	Pump Seal	2
12	078F017	Shaft Retaining Ring	4
13	018X041	Bearing Sleeve, Rear Plate	2
14	100865	Rear Plate Assembly	1
15	100908	M4 x 25 SHC Screw	2
16	104158	M10 Flange Nut	4
17	104073	M10-1.5 x 105 All Thread	4



Component Illustration: 1.54 cc / Rev, Single Gear Pump Assembly #100860

Bill of Materials for 4.50 cc / Rev. , Single Gear Pump Assembly # 100862

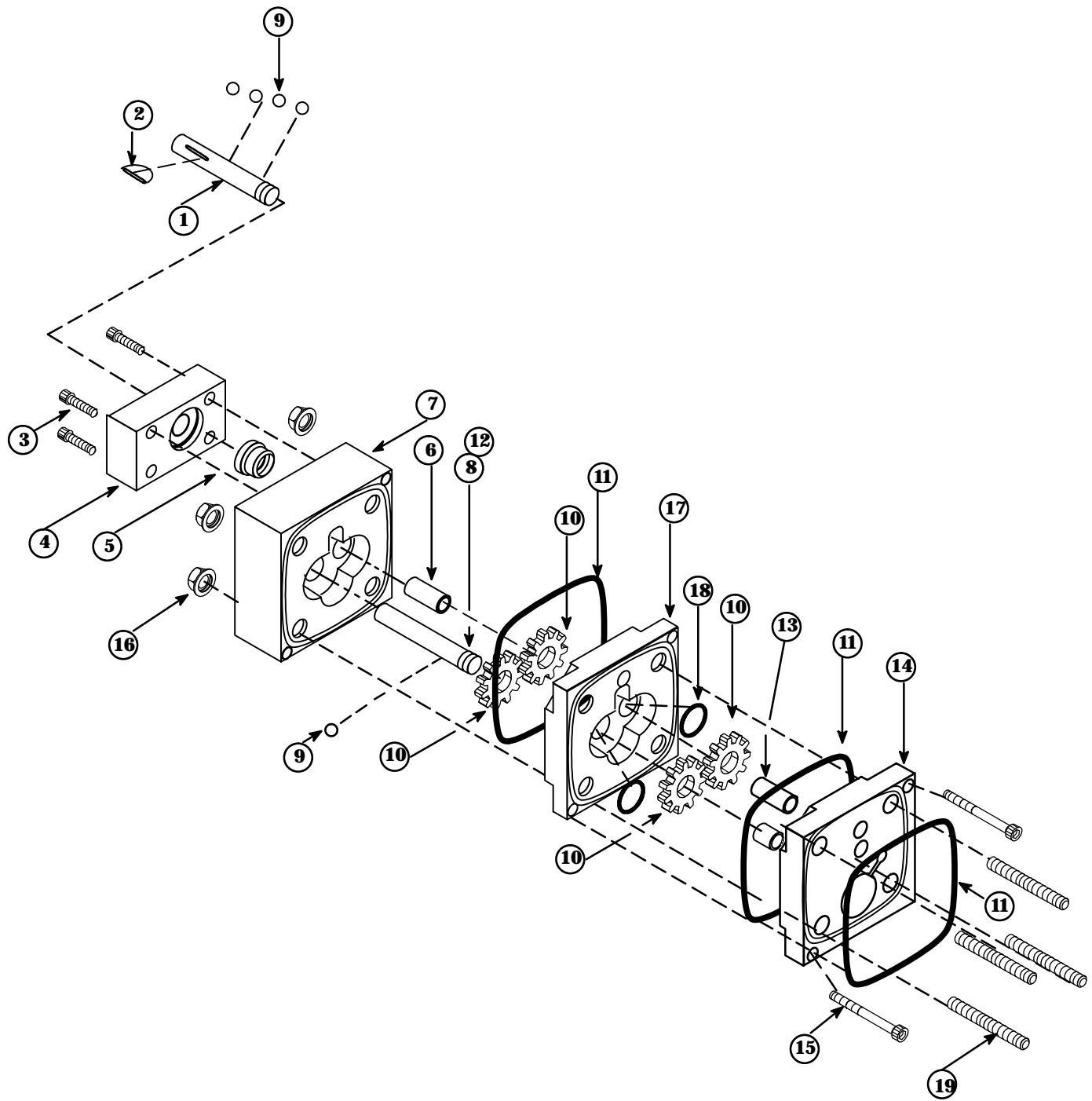
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	012D072	Drive Shaft	1
2	078I001	Key, Woodruff	1
3	101626	M5 x 12 SHC Screw	4
4	069X160	Seal Retainer & Bearing Housing	1
5	069X061	Lip Seal	1
6	018X041	Bearing Sleeve	2
7	100868	Front Plate Assembly	1
8	012D073	Driven Gear Shaft	1
9	018X031	Ball, 1/8" Diameter	4
10	012C018	Drive Gear, 4.5 cc/rev	2
11	069X064	Pump Seal	2
12	078F017	Shaft Retaining Ring	4
13	018X041	Bearing Sleeve, Rear Plate	2
14	100865	Rear Plate Assembly	1
15	100908	M4 x 25 SHC Screw	2
16	104158	M10 Flange Nut	4
17	104073	M10-1.5 x 105 All Thread	4



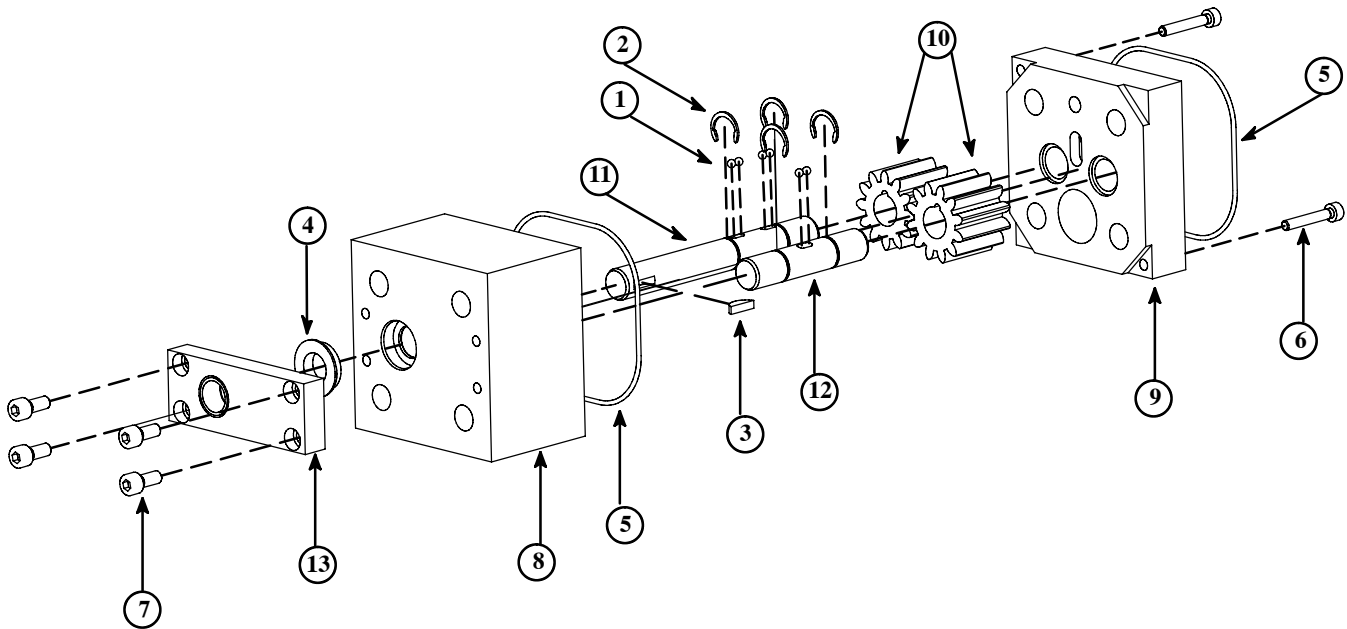
Component Illustration: 4.50 cc / Rev, Single Gear Pump Assembly #100862

Bill of Materials for 3.2 cc / Rev. , Dual Gear Pump Assembly # 100864

<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	012D088	Drive Shaft	1
2	078I001	Key, Woodruff	1
3	101626	M5 x 12 SHCS	4
4	069X160	Seal retainer & Bearing Housing	1
5	069X061	Lip Seal	1
6	018X041	Bearing Sleeve	2
7	100867	Front Plate Assembly	1
8	012D087	Driven Gear Shaft	1
9	018X031	Ball, 1/8" Dia.	5
10	012C019	Drive Gear, 3.2 cc/Rev	4
11	069X064	O-ring, -041	3
12	078F017	Shaft Retaining Ring	4
13	018X041	Bearing Sleeve, rear Plate	2
14	100865	Rear Plate Assembly	1
15	101691	M4 x 40 SHCS	2
16	104158	M10 Flange Nut	4
17	100870	Middle Plate	1
18	N00198	O-ring, -113	2
19	107749	M10-1.5 x 118 STUD	4

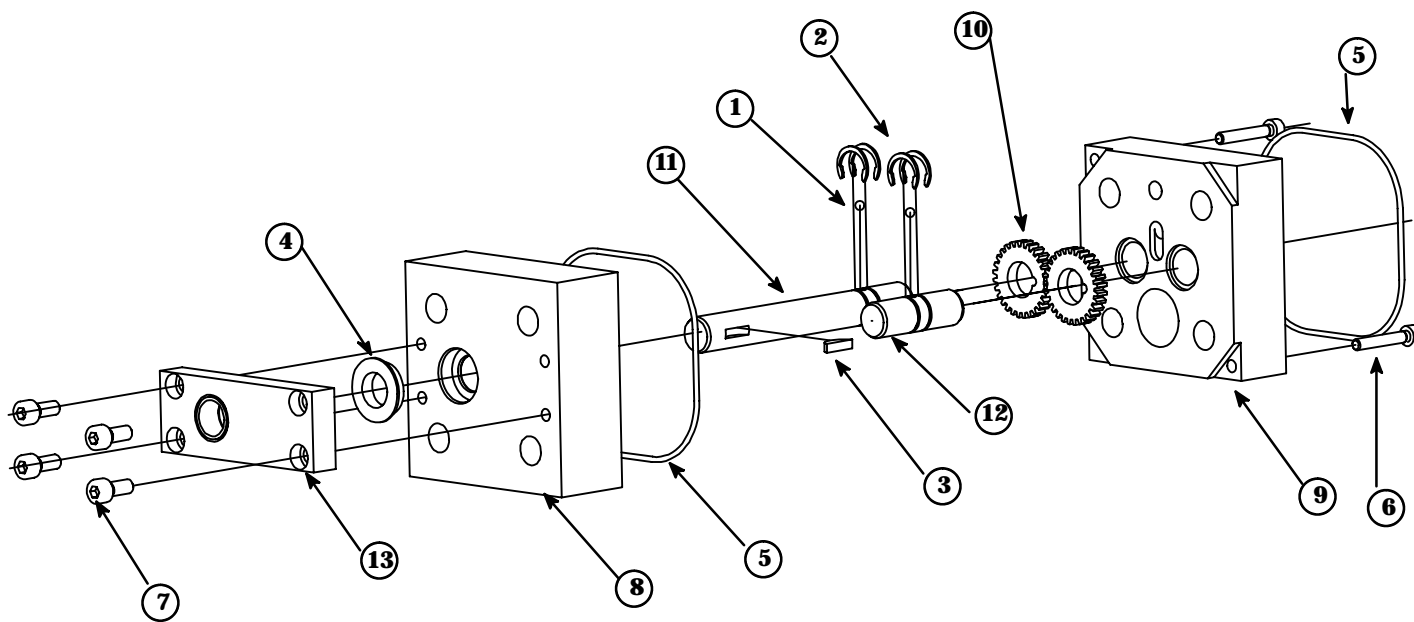


Component Illustration: 3.2 cc / Rev, Dual Gear Pump Assembly #100864



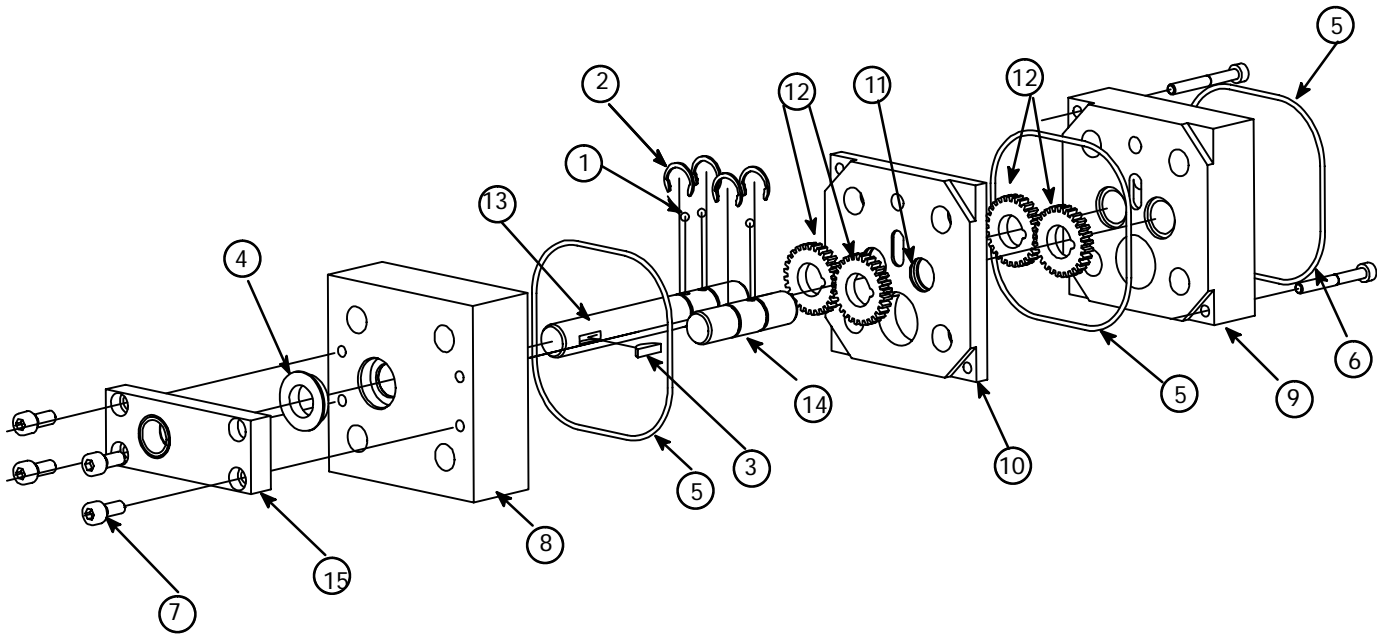
Bill of Materials for 10cc Single Gear Pump Assembly # 109690

Item No.	Part Number	Description	Qty.
1	018X031	Ball Bearing, 1/8 Dia.	6
2	078F017	Snap Ring, 1/2"	4
3	078I001	Key Woodruf, #404	1
4	069X061	Shaft Seal	1
5	069X064	O-ring, -041	2
6	108588	M4x25mm, Blk SHC Screw	2
7	101626	M5-0.8 x 12mm SHC Screw	4
8	109685	Pump Body10cc Rev	1
9	109686	Rear Bearing Plate 10cc Rev.	1
10	109689	Gear 10cc Rev	2
11	109687	Drive Shaft 10cc/ 20cc	1
12	109688	Driven shaft, 10cc/20cc	1
13	069X160	Shaft Seal Retainer	1
14	001U002	Dow Corning 112 Lubricant (not shown)	



Bill of Materials for 0.55 cc Rev. Single Gear Pump Assembly # 109908

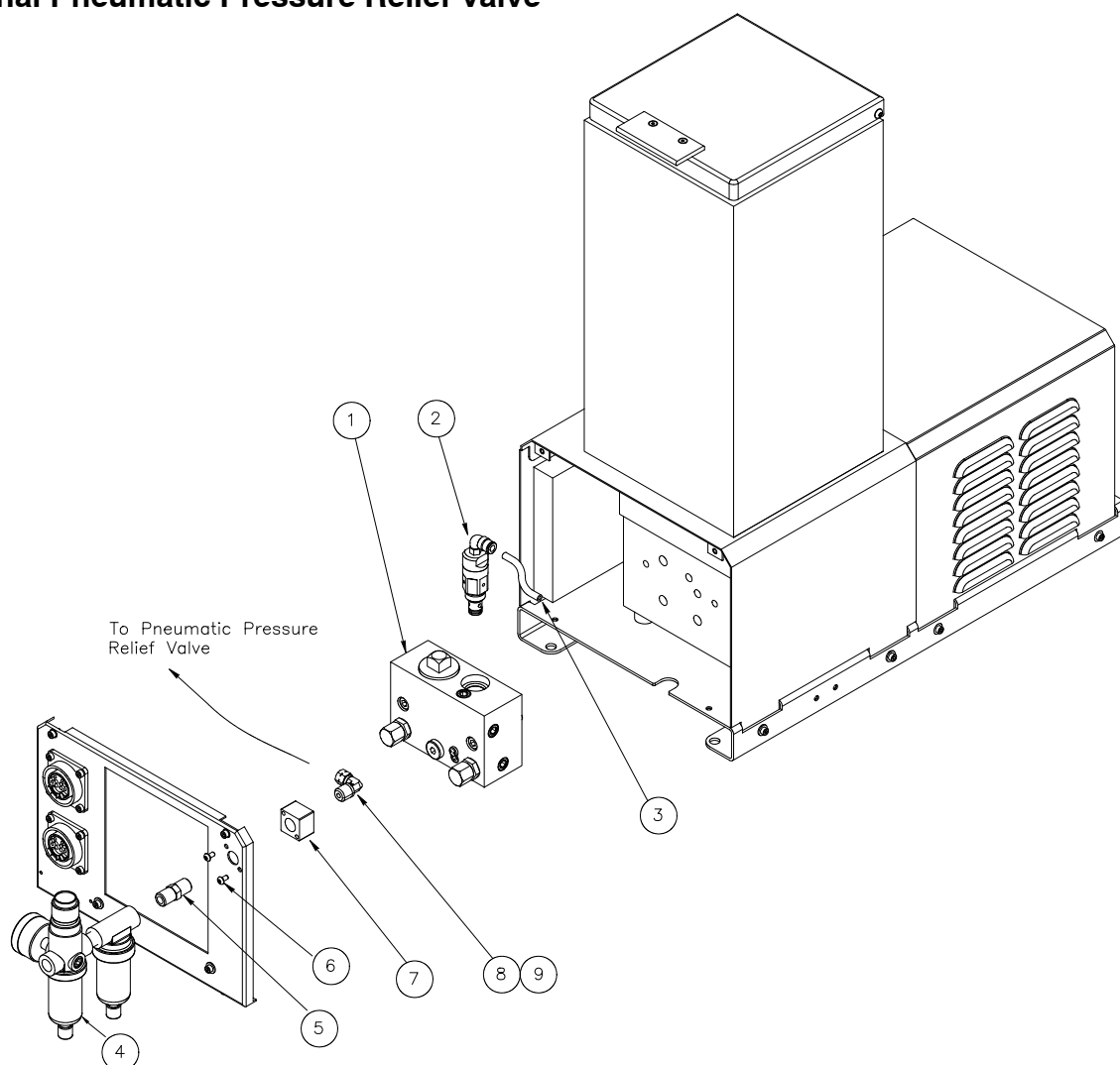
Item No.	Part Number	Description	Qty.
1	018X031	Ball bearing, 1/8 Dia.	6
2	078F017	Snap ring, 1/2"	4
3	078I001	Key Woodruf, #404	1
4	069X061	Shaft Seal	1
5	069X064	O-ring, -041	2
6	100908	M4-0.7 x 25mm SHC Screw	2
7	101626	M5-0.8 x 12mm SHC Screw	4
8	109906	Plate Front, .55cc/ Rev.	1
9	100865	Rear Bearing Plate .55cc Rev.	1
10	109907	Gear .55cc Rev	2
11	012D079	Drive Shaft 1.5cc Dual	1
12	012D080	Driven shaft, 1.5 cc Dual	1
13	069X160	Shaft seal retainer	1
14	001U002	Dow Corning 112 Lubricant (Not Shown)	



Bill of Materials for 0.55cc/ Rev. Dual Gear Pump Assembly # 109909

Item No.	Part Number	Description	Qty.
1	018X031	Ball bearing, 1/8 Dia.	6
2	078F017	Snap ring, 1/2"	4
3	078I001	Key Woodruf, #404	1
4	069X061	Shaft Seal	1
5	069X064	O-ring, -.041	2
6	101692	M4-0.7 x 35mm SHC Screw	2
7	101626	M5-0.8 x 12mm SHC Screw	4
8	109906	Plate Front, .55cc/ Rev.	1
9	100865	Rear Bearing Plate .55cc Rev.	1
10	109905	Plate, Middle Gear, 0.55/ Rev.	1
11	N00198	O-ring, -.113	2
12	109907	Gear .55cc Rev	4
13	012D083	Drive Shaft 1.5 cc Dual	1
14	012D082	Driven Shaft, 1.5 cc Dual	1
15	069X160	Shaft Seal Retainer	1
16	001U002	Dow Corning 112 Lubricant (Not Shown)	

Optional Pneumatic Pressure Relief Valve



Item No.	Part Number	Description	Qty.
1.	116713	Filter Manifold Assy, Pneumatic PRV	1
	(includes items 2. For all other components see page 10-12).		
2.	115540 *	Pneumatic Pressure Relief Valve	1
3.	N07677	Teflon Tubing, 1/4" O.D.	0.7 Ft
4.	100380	Filter/Regulator Assy	1
5.	072X228	Fitting, Hex Nipple, 1/4 NPT	1
6.		Screw, SHC, M4X0.7 x 8	2
7.	101888	Block, Pneumatic Transfer	1
8.	N00101	90° Fitting, 1/4 Tube x 1/4 NPT	1
9.	072X383	Airline Support (not shown)	1

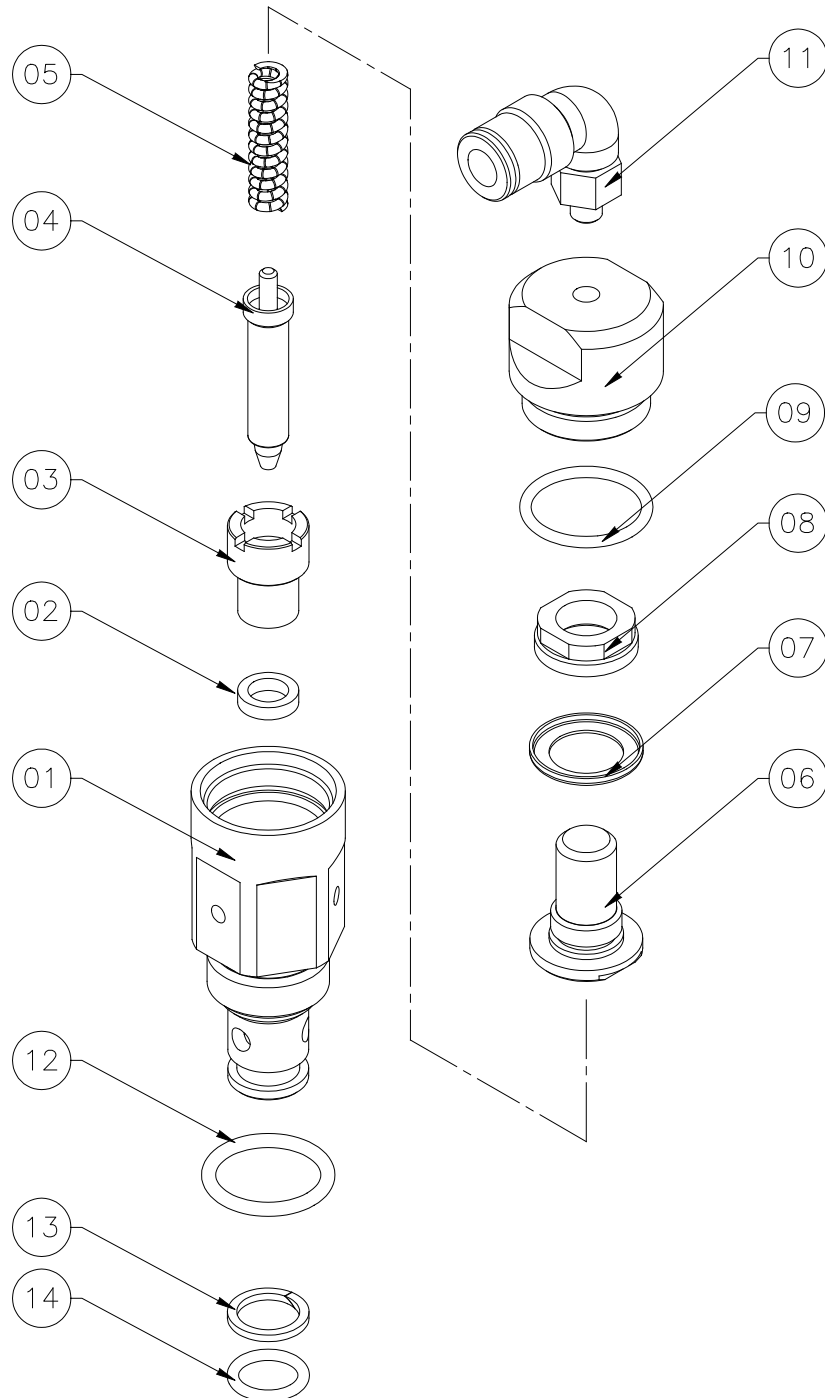
* See detailed drawing on following pages.

Bill of Materials for PN 115540 Pneumatic Pressure Relief Valve

<i>Item No.</i>	<i>Part Number</i>	<i>Qty.</i>	<i>Description</i>	
15	108700	A/R	EA	LUBE, HT TFE
14	N00179	1	EA	O-RING, -012, VITON
13	N05733	1	EA	BACKUP RING, -012, SPLIT PTFE
12	N01601	1	EA	O-RING, -908, VITON
11	115438	1	EA	FTG, 90°, M5 X 1/4" TUBE
10	115538	1	EA	CAP, VALVE BODY
09	N00184	1	EA	O-RING, -017, VITON
08	115536	1	EA	RETAINER, PISTON SEAL
07	115537	1	EA	PISTON SEAL
06	115535	1	EA	PISTON, LOWER
05	115539	1	EA	SPRING, COMPRESSION
04	115533	1	EA	STEM, VALVE
03	115534	1	EA	SEAL RETAINER
02	115437	1	EA	SEAL, STEM
01	115532	1	EA	VALVE BODY

Bill of Materials for PN 116326 Repair Kit for Pneumatic Pressure Relief Valve (PN 115540)

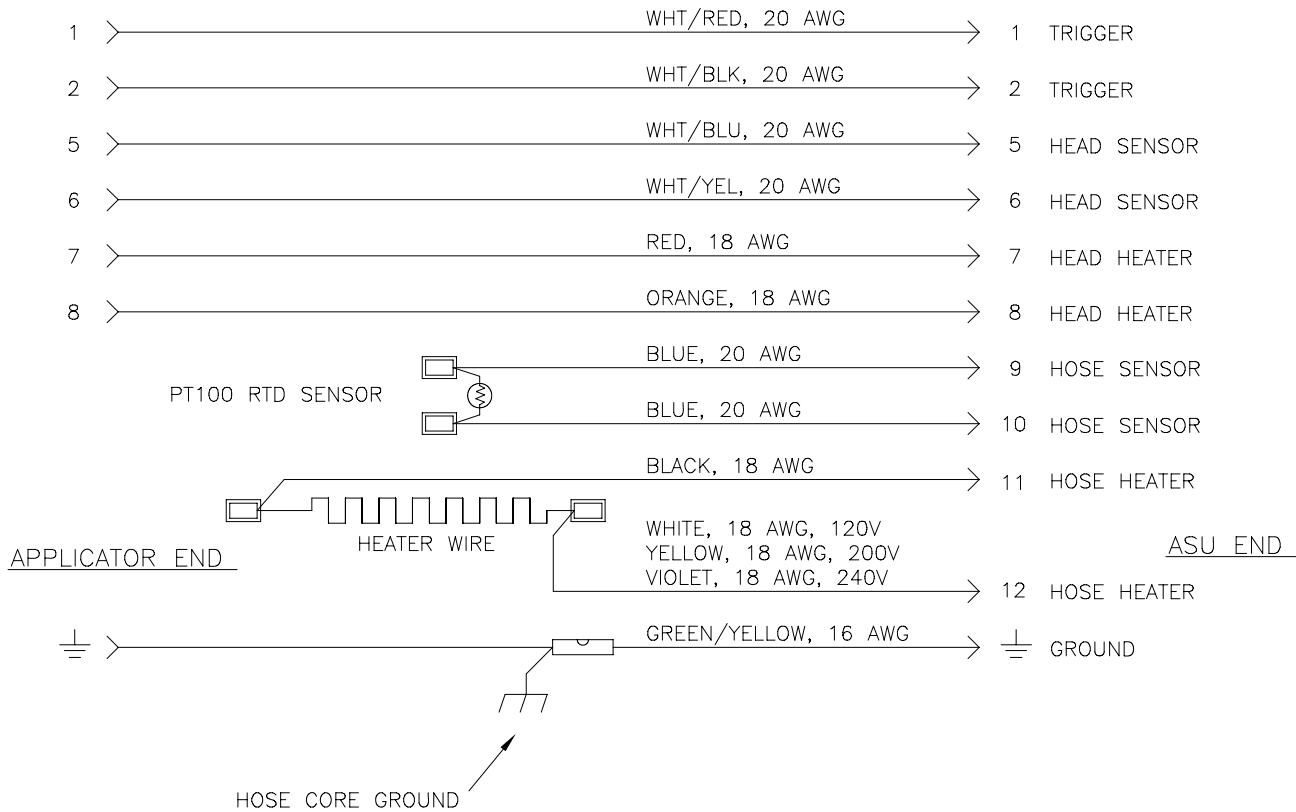
<i>Item No.</i>	<i>Part Number</i>	<i>Qty.</i>	<i>Description</i>	
15	108700	A/R	EA	LUBE, HT TFE
14	N00179	1	EA	O-RING, -012, VITON
13	N05733	1	EA	BACKUP RING, -012, SPLIT PTFE
12	N01601	1	EA	O-RING, -908, VITON
11	115438	1	EA	FTG, 90°, M5 X 1/4" TUBE
09	N00184	1	EA	O-RING, -017, VITON
07	115537	1	EA	PISTON SEAL
05	115539	1	EA	SPRING, COMPRESSION
02	115437	1	EA	SEAL, STEM



Component Illustration: PN 115540 Pneumatic Pressure Relief Valve

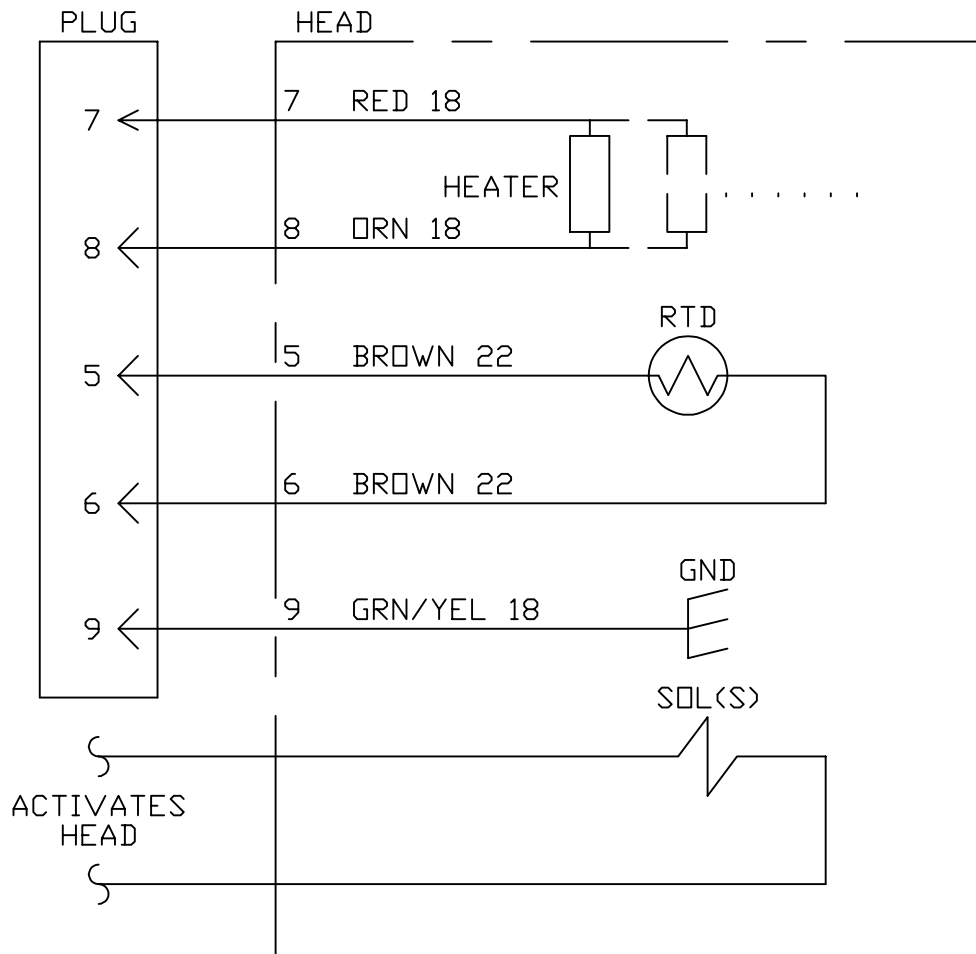
Chapter 11

SYSTEM SCHEMATICS & ENGINEERING DRAWINGS



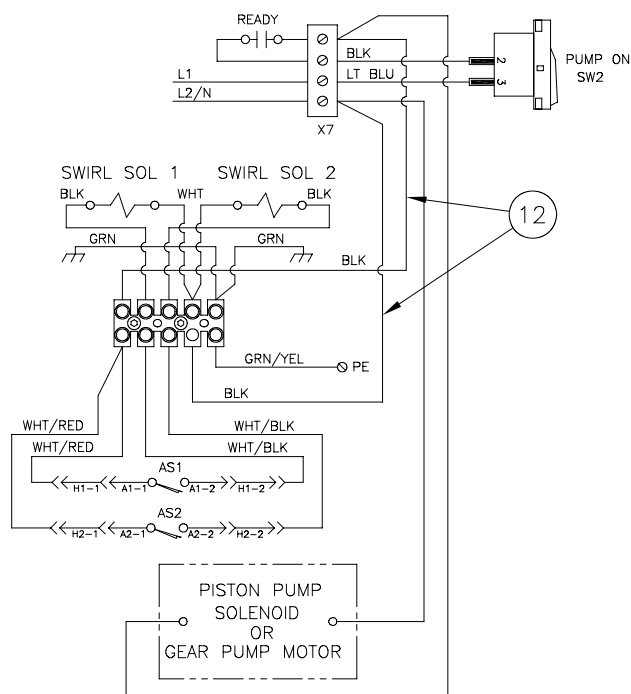
NOTES:

1. ALL WIRING IS ROUTED THROUGH THE HOSE.,
2. WIRE SIZES SHOWN ARE FOR NO. 6 AND NO. 8 HOSES UP TO 24 FT. IN LENGTH. FOR LARGER DIAMETER AND LONGER HOSES, HEATER LEAD WIRES ARE 16 AWG. OTHER WIRE SIZES, AND COLORS, MAY BE CHANGED IN SPECIAL HOSES, PER CUSTOMER REQUEST.

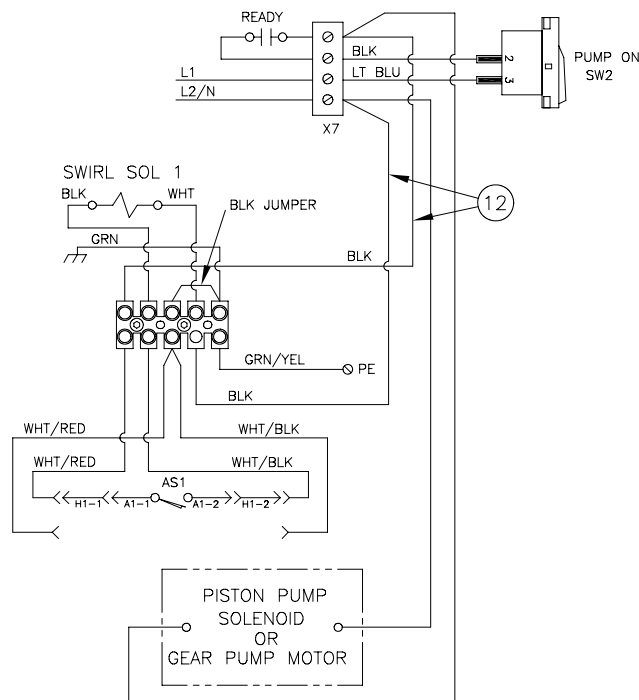


Notes:

1. ALL WIRE MIL-W-22759/10 OR 12, MINIMUM 600 VOLTS, 260 DEG. C
2. SOLENOID(S) VOLTAGE AND TIMING METHOD DEPENDS ON APPLICATION.
3. RTD WILL BE PLATINUM 100 OHM.



SWIRL AIR CONTROL
BY TWO TRIGGER SWITCHES



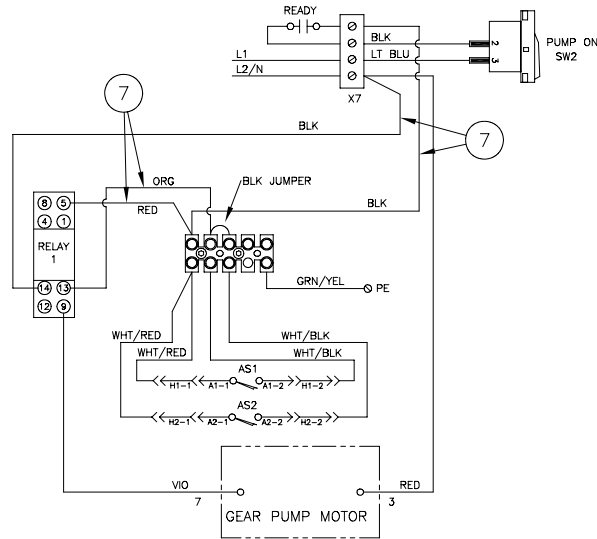
SWIRL AIR CONTROL BY ONE TRIGGER SWITCH

Item #12 = PN 112678 Dynamini Swirl
Kit Wire Group

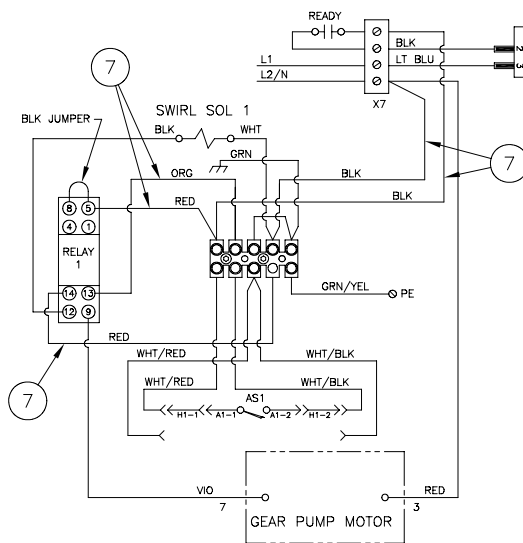
DYNAMINI MOTOR ENABLE RELAY KITS:

KIT PART NO.	NOMINAL DESCRIPTION	VOLTAGE	SOLENOID PART NO.	VALVE QTY
111892	120V SINGLE	110-120 VAC 50/60 HZ	CA4001	1
111893	120V DUAL	110-120 VAC 50/60 HZ	CA4001	2
111894	240V SINGLE	220-240 VAC 50/60 HZ	107201	1
111895	240V DUAL	220-240 VAC 50/60 HZ	107201	2

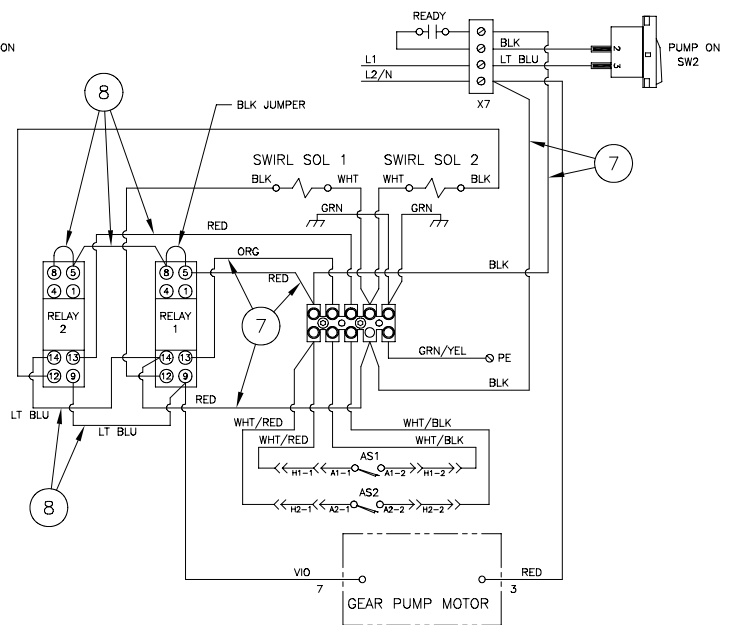
PART NO.	NOMINAL DESCRIPTION
112679	120V SINGLE
112680	120V DUAL
112681	240V SINGLE
112682	240V DUAL



MOTOR ENABLE BY EITHER OF TWO TRIGGER SWITCHES



MOTOR ENABLE AND SWIRL AIR CONTROL
BY ONE TRIGGER SWITCH



MOTOR ENABLE AND SWIRL AIR CONTROL
BY TWO TRIGGER SWITCHES

KIT PART NO.	NOMINAL DESCRIPTION	VOLTAGE
112679	120V SINGLE	110-120 VAC 50/60 HZ
112680	120V DUAL	110-120 VAC 50/60 HZ
112681	240V SINGLE	220-240 VAC 50/60 HZ
112682	240V DUAL	220-240 VAC 50/60 HZ

Item #7 = PN 112684 Motor Enable
Kit Wire Group

Item #8 = PN 112685 2nd Relay Kit
Wire Group

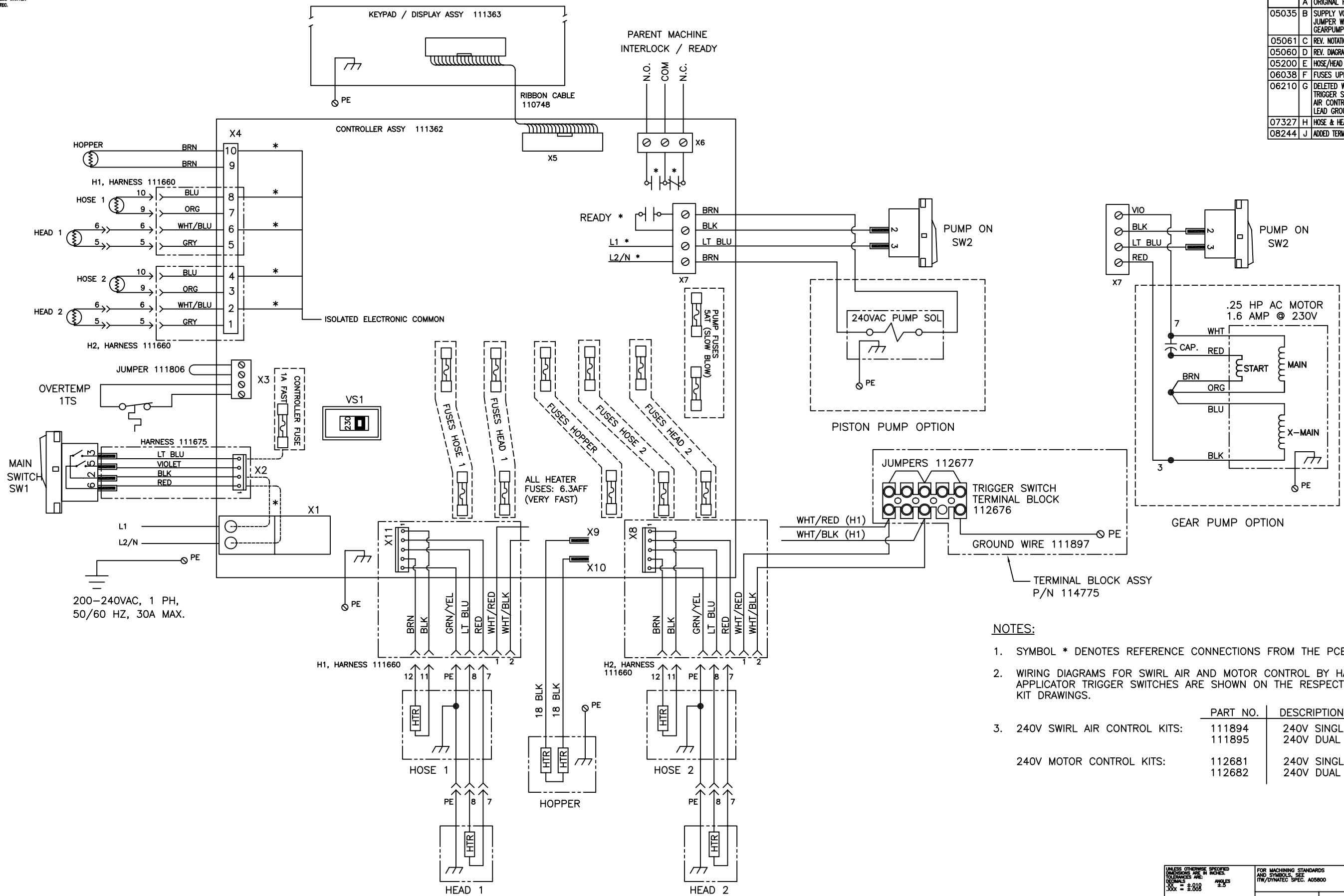
ITW Dynatec
An Illinois Tool Works Company




Adhesive Application Solutions

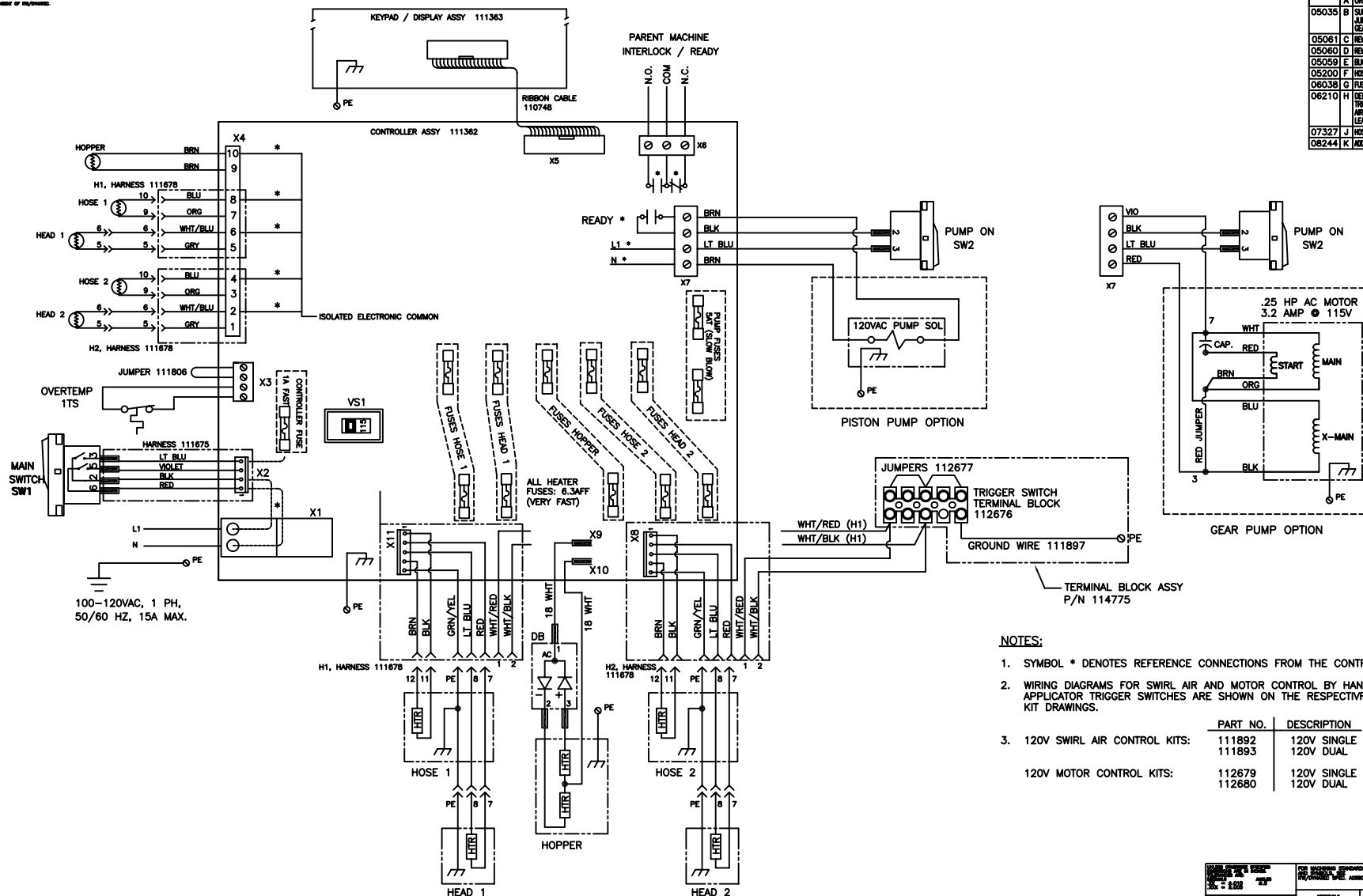
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DWG. NO.		REV.			
111688		SH	J		
REVISIONS					
REL.	REV.	DESCRIPTION	DATE	BY	APPROVED
	A	ORIGINAL RELEASE	11.15.04	DH	
05035	B	SUPPLY VOLTAGE WAS 208-240, 24A; JUMPER WAS READY TSTAT; MODIFIED GEARPUMP SCHEMATIC; ADDED NOTE.	01.26.05	PJD	
05061	C	REV. NOTATION, TRIGGER/FT & SWIRL OPTIONS.	2.02.05	PJD	
05060	D	REV. DIAGRAM, TRIGGER/FT & SWIRL OPTIONS.	2.11.05	PJD	
05200	E	HOSE/HEAD HARNESS CHANGED	5.24.05	DH	
06038	F	FUSES UPDATED	1.09.06	DH	
06210	G	DELETED WIRING DIAGRAMS FOR FOOT & TRIGGER SWITCH OPERATIONS & SWIRL AIR CONTROL; ADDED TRIGGER SWITCH LEAD GROUNDING; ADDED NOTES 2 & 3.	4.20.06	PJD	
07327	H	HOSE & HEAD SENSOR CONTACT ID'S REVISED.	10.12.07	PJD	
08244	J	ADDED TERMINAL BLOCK ASSY PART NUMBER	7.1.08	BB	



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS XXX = ±.010 XXX = ±.005		FOR MACHINING STANDARDS AND SYMBOLS, SEE ITW/DYNATEC SPEC. A05800		 HENDERSONVILLE, TN		U/M EA		
USED ON	APPROVALS		DATE			WIRING DIAGRAM, DYNAMINI ASU, VERSION 2, 240VAC		STATUS R
CHECKED	DH		11.15.04					SOURCE
NEXT ASSY.	COMPUTER DESCRIPTION(25 CHARACTERS)		SIZE	DWG. NO.	REV.	GROUP		
DO NOT SCALE DRAWING	WIRE DIAG,DMINI,V2,240V		D	111688	J			
			SCALE N.T.S.	CAD DRAWING	SHEET 1	OF 1		

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- NOTES:

1. SYMBOL * DENOTES REFERENCE CONNECTIONS FROM THE CONTROL PCB.
 2. WIRING DIAGRAMS FOR SWIRL AIR AND MOTOR CONTROL BY HAND APPLICATOR TRIGGER SWITCHES ARE SHOWN ON THE RESPECTIVE KIT DRAWINGS.
- | | PART NO. | DESCRIPTION |
|---------------------------------|----------|-------------|
| 3. 120V SWIRL AIR CONTROL KITS: | 111892 | 120V SINGLE |
| | 111893 | 120V DUAL |
| 120V MOTOR CONTROL KITS: | 112679 | 120V SINGLE |
| | 112680 | 120V DUAL |

DATE: 11/15/04 TIME: 11:50 BY: J. J. J.	FOR INFORMATION PURPOSES THIS DOCUMENT IS NOT TO BE USED FOR ANY OTHER PURPOSES.	 DYNATRONICS, INC. 1116689	E 11/15/04
USED IN: TEST AREA:	APPROVALS: _____ DATE: 11.15.04 DESIGNED: _____	WIRING DIAGRAM, DYNAMINI ASU, VERSION 2, 120VAC	11/15/04
DO NOT SCALE DIMENSIONS	COMPUTER GENERATED DRAWING WIRE D04CMM12V120V	1116689	K